

# Grade 9 EQAO Assessment of Mathematics

# Applied

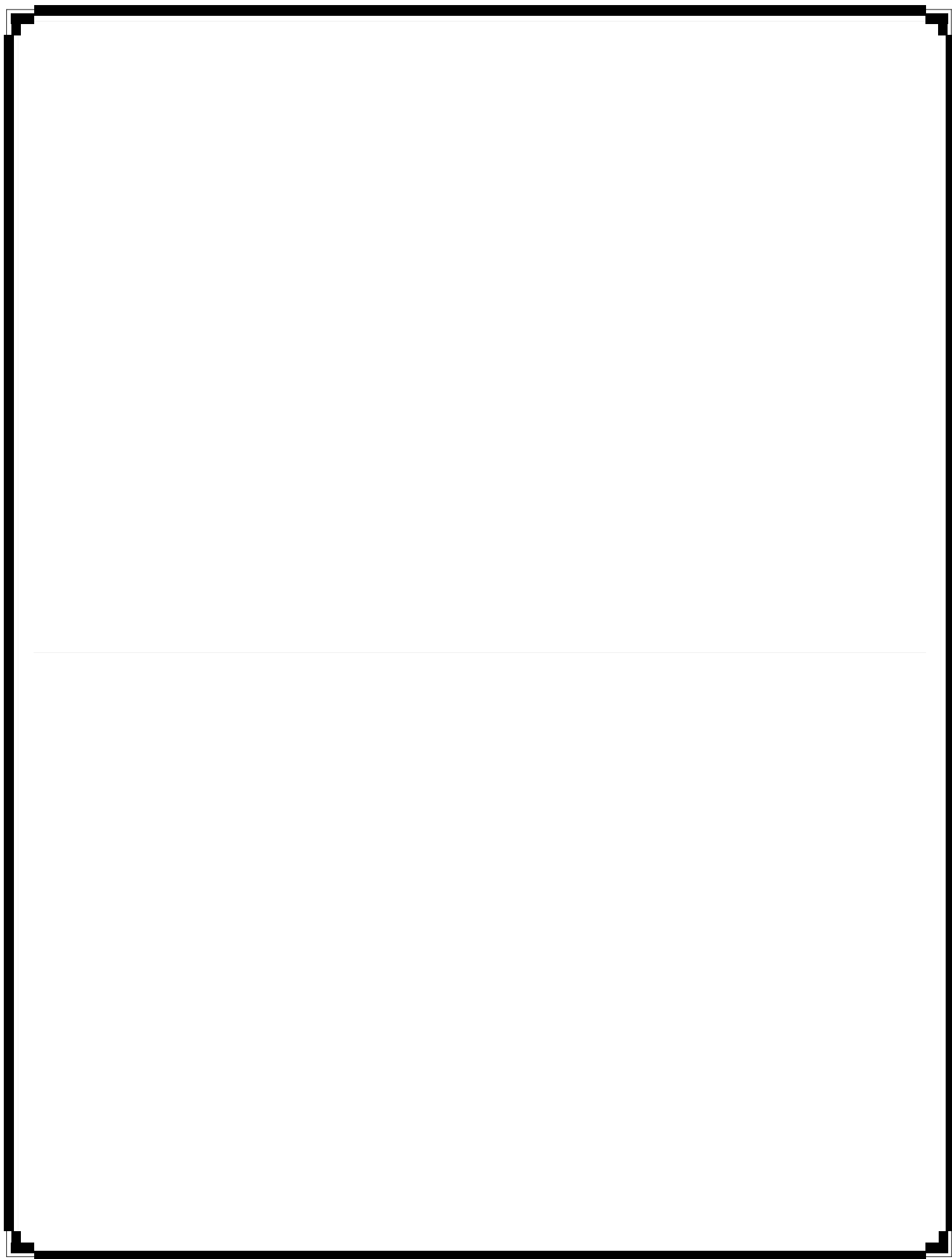
## Student Preparation Booklet

Name: \_\_\_\_\_

Teacher: \_\_\_\_\_

School: \_\_\_\_\_

**Contents:** Key Words  
Strategies for Multiple Choice and Open Response Questions  
EQAO Formula Sheet  
Sample Questions from the Winter 2009 Assessment  
Sample Questions from the Spring 2009 Assessment  
Sample Questions from the Winter 2008 Assessment  
Sample Questions from the Spring 2008 Assessment  
Sample Questions from the Winter 2007 Assessment  
Sample Questions from the Spring 2007 Assessment



# **Grade 9 EQAO Assessment of Mathematics**

## **Key Words**

Throughout the assessment, key words are used to identify the type of response required from you. The key words are explained below. Refer to this sheet to make sure you are responding fully to each question.

### **Compare:**

Tell what is the same and what is different.

### **Describe:**

Use words to create a mental picture for the reader.

### **Determine:**

Use mathematics to find a solution to the problem.

### **List:**

Use point form.

### **Explain:**

Use words and symbols to make your solution clear.

### **Justify:**

Give reasons and evidence to show your answer is correct.

### **Show your work:**

Record all calculations and all the steps you went through to get your answer. You may use words, numbers, graphs, diagrams, symbols and/or charts.

## **Tools you should have access to:**

- Pencil, ruler and eraser
- Scientific or Graphing calculator (You may not share with another student)
- Manipulatives (example: integer or algebra tiles)

## **Strategies for Multiple Choice Questions:**

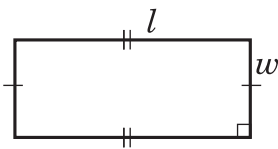
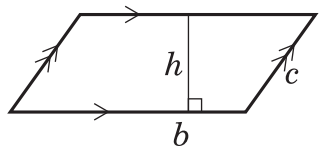
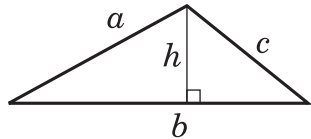
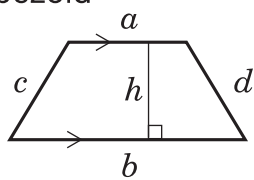
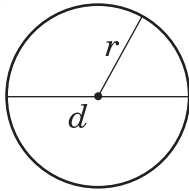
1. Cover the question choices and read the question stem carefully and highlight key words.
2. Look at the choices and eliminate any of the responses that are not possible.
3. There is only **one** answer per question. Choose the best possible answer and shade your choice on the answer sheet.
4. Answer every question, there are no penalties for guessing.
5. Question that have a graph are drawn to scale. Questions that have a diagram are usually not drawn to scale.

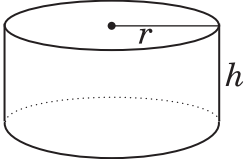
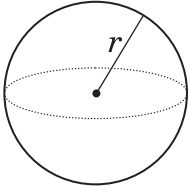
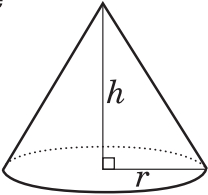
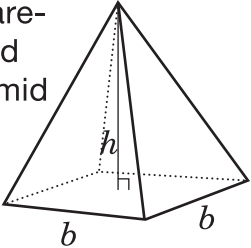
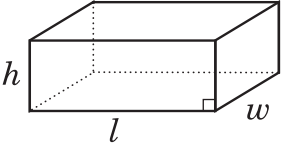
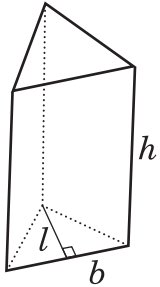
## **Strategies for Open Response Questions:**

1. These questions are designed to get you to think deeply about the mathematics you know. Complete solutions including any rough work are expected for these questions.
2. Read the question carefully and highlight any key words or information.
3. Write your solution in the space provided.
4. Don't erase any of your calculations, drawing or reasoning.
5. Use the list of key words on the previous page to help you decide what is expected in your answer. For example, **explain** means to use words and symbols to make your solution clear and understandable.
6. The problems in these questions often have more than one way of being solved. Be sure to clearly explain your solution using pictures numbers and words.

# Formula Sheet

## Grade 9 Applied

Geometric Figure	Perimeter	Area
<p>Rectangle</p> 	$P = l + l + w + w$ or $P = 2(l + w)$	$A = lw$
<p>Parallelogram</p> 	$P = b + b + c + c$ or $P = 2(b + c)$	$A = bh$
<p>Triangle</p> 	$P = a + b + c$	$A = \frac{bh}{2}$ or $A = \frac{1}{2}bh$
<p>Trapezoid</p> 	$P = a + b + c + d$	$A = \frac{(a + b)h}{2}$ or $A = \frac{1}{2}(a + b)h$
<p>Circle</p> 	$C = \pi d$ or $C = 2\pi r$	$A = \pi r^2$

Geometric Figure	Volume
Cylinder 	$V = (\text{area of base})(\text{height})$  $V = \pi r^2 h$
Sphere 	$V = \frac{4}{3} \pi r^3$ or $V = \frac{4\pi r^3}{3}$
Cone 	$V = \frac{(\text{area of base})(\text{height})}{3}$  $V = \frac{1}{3} \pi r^2 h$ or $V = \frac{\pi r^2 h}{3}$
Square-based pyramid 	$V = \frac{(\text{area of base})(\text{height})}{3}$  $V = \frac{1}{3} b^2 h$ or $V = \frac{b^2 h}{3}$
Rectangular prism 	$V = (\text{area of base})(\text{height})$  $V = lwh$
Triangular prism 	$V = (\text{area of base})(\text{height})$  $V = \frac{1}{2} blh$ or $V = \frac{blh}{2}$

# Applied

## Grade 9 Assessment of Mathematics

Winter 2009

### **SAMPLE ASSESSMENT QUESTIONS**

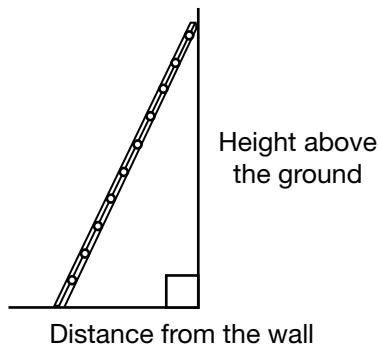
**Record your answers to the multiple-choice questions  
on the blank Student Answer Sheet (Winter 2009, Applied).**

Education Quality and  
Accountability Office



Please note: The format of  
this booklet is different from  
that used for the assessment.  
The items themselves remain  
the same.

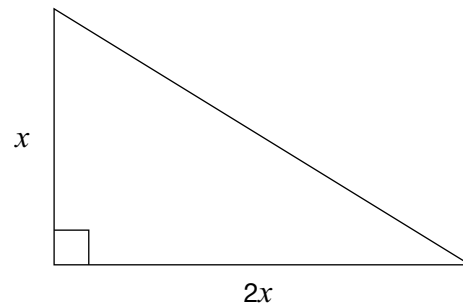
- 1** Sunita places a ladder against a wall. For safety reasons, the ratio of the height above the ground to the distance from the wall should be 5:2.



She places the top of the ladder 6.5 m above the ground. Which of the following is closest to the distance from the wall?

- a 2.6 m
  - b 3.3 m
  - c 5.4 m
  - d 16.3 m
- 2** Paper is sold in different-sized packages. Which package has the lowest cost per sheet?
- a \$1.00 for 150 sheets
  - b \$1.20 for 200 sheets
  - c \$2.50 for 500 sheets
  - d \$5.50 for 1000 sheets

- 3** A gardener designs a rose bed in the shape of a right triangle. The ratio of the two shorter sides is 2:1.



If the area is 25 square units, what are the dimensions of the shorter sides?

Hint:  $A = \frac{bh}{2}$

- a 1, 2
  - b 1, 3
  - c 5, 5
  - d 5, 10
- 4** What is a simplified form of the expression  $2x - 3 - 5x + 1$ ?
- a  $3x - 2$
  - b  $3x + 2$
  - c  $-3x - 2$
  - d  $-3x + 2$
- 5** What is the value of  $x$  that satisfies the equation  $4x - 9 = 2x + 3$ ?
- a 2
  - b 3
  - c 5
  - d 6



**6 Jobs**

Peter has two part-time jobs. His earnings for one week are represented by the equation below:

$$E = 7.50r + 8.25v$$

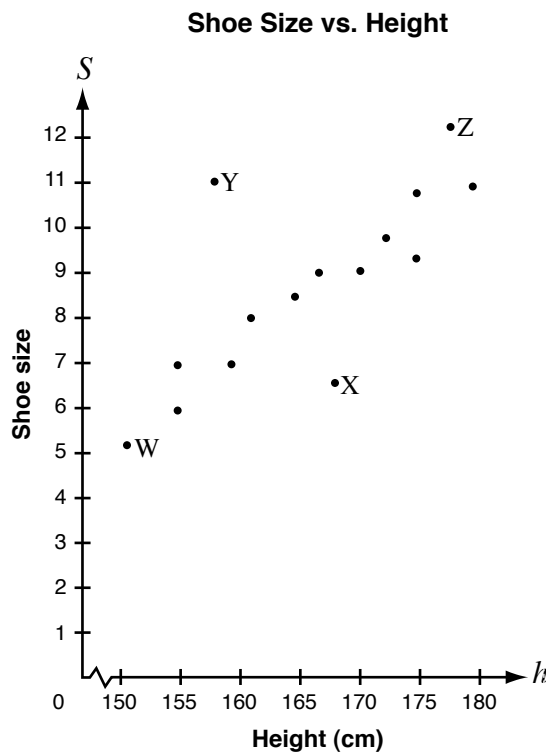
- $E$  is his total earnings in one week;
- $r$  is the number of hours he works at the restaurant and
- $v$  is the number of hours he works at the video store.

Peter earns a total of \$117.75 in one week. If he works 8 hours at the restaurant, how many hours does he work at the video store?

Show your work.



- 7** The graph shows the shoe sizes of girls of various heights.

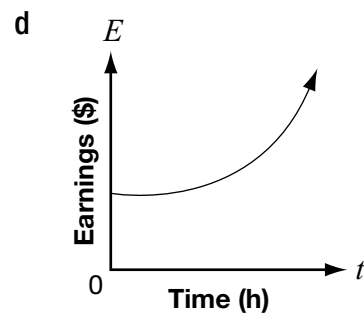
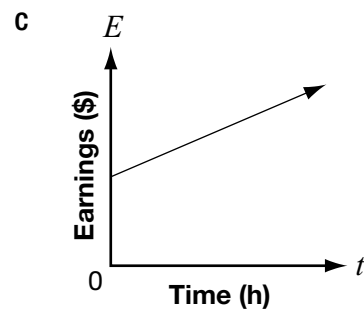
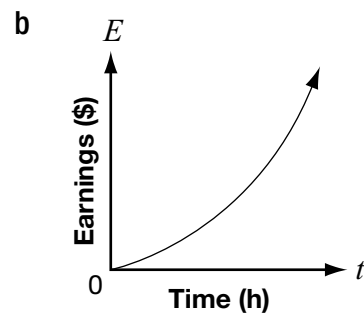
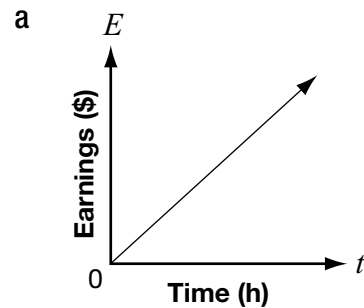


Which point represents a girl whose shoe size is smaller than expected for a girl of her height?

- a W
- b X
- c Y
- d Z

- 8** Koshen is creating his own summer gardening job. For each garden, he will charge a \$10 initial consultation fee plus \$8 per hour.

Which graph best represents Koshen's earnings for each garden?



- 9** Which of the following tables represents a non-linear relation?

**a**

$n$	$C$
0	7
2	11
4	15
6	19
8	23

**b**

$n$	$C$
0	16
1	13
2	10
3	7
4	4

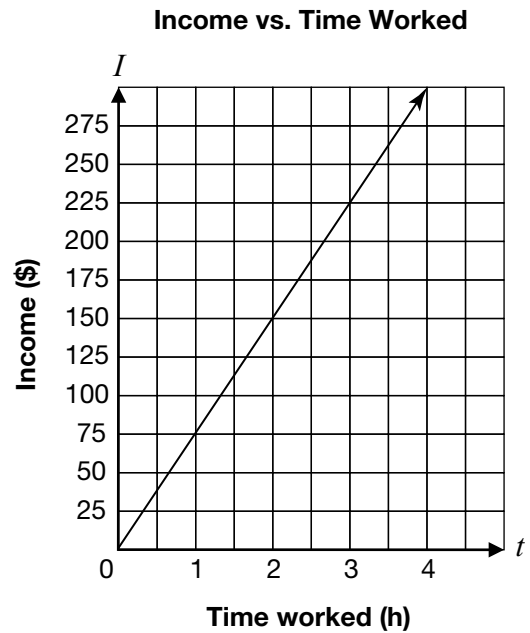
**c**

$n$	$C$
0	12
2	10
4	8
6	6
8	4

**d**

$n$	$C$
0	1
1	2
2	4
3	7
4	11

- 10** Joe owns an auto-repair shop. He charges his customers an hourly rate for repairs. The relationship between his income and the amount of time he works is shown below.



What is Joe's hourly rate?

- a** \$25/hour
- b** \$75/hour
- c** \$150/hour
- d** \$225/hour

- 11** A banquet hall charges a \$1500 rental fee, plus \$25 per person.

Which table below shows this relation?

**a** Banquet Charges

Number of people	Total cost (\$)
0	1500
5	1525

**b** Banquet Charges

Number of people	Total cost (\$)
0	1500
5	3000

**c** Banquet Charges

Number of people	Total cost (\$)
5	125
250	6250

**d** Banquet Charges

Number of people	Total cost (\$)
5	1625
250	7750

- 12** The cost,  $C$ , in dollars of producing  $n$  yearbooks is represented by the equation

$$C = 1000 + 5n.$$

How much would it cost to produce 75 yearbooks?

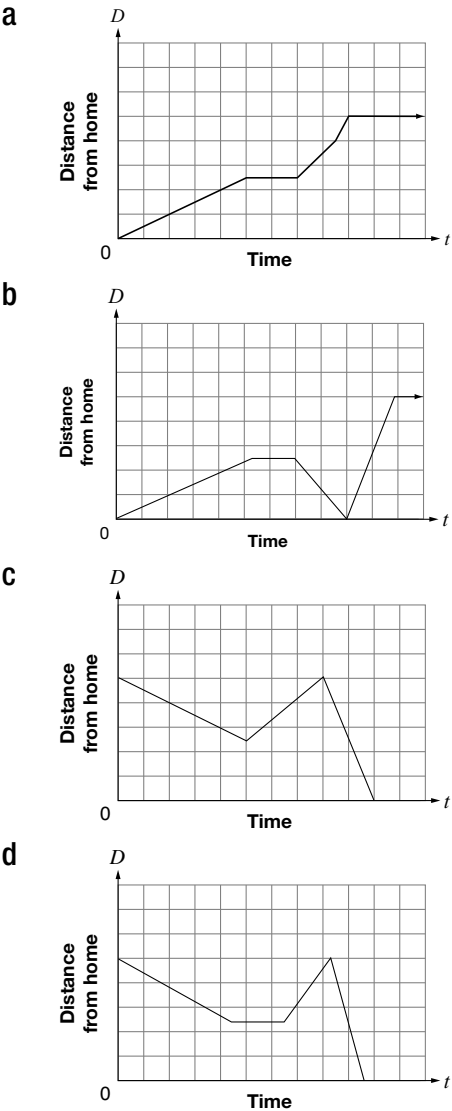
- a** \$375  
**b** \$625  
**c** \$1000  
**d** \$1375



**13** Maya's Trip to School

- Maya walks to her friend Kadeem's house, which is halfway between her home and the school.
- They stay at Kadeem's house for a few minutes, until Maya remembers that she has forgotten her lunch.
- Maya runs back home to get her lunch.
- When she gets home, her mother drives her to school so that she will not be late.

Which graph most accurately represents Maya's trip to school?

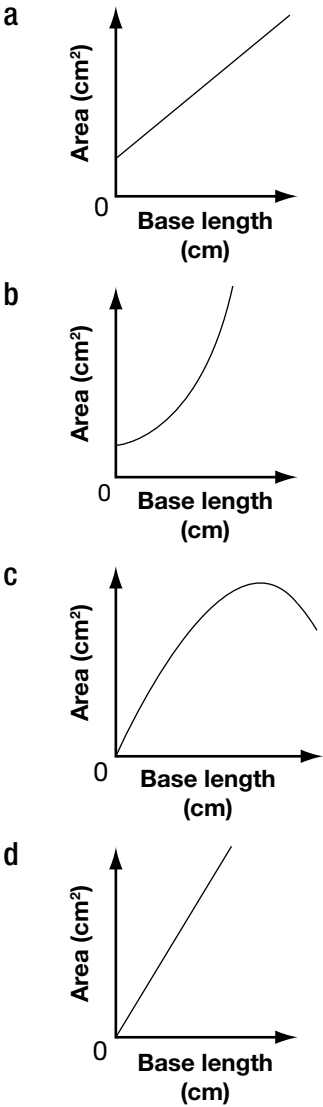


**14** The data for five isosceles triangles with perimeters of 24 cm are shown below.

Triangles With 24 cm Perimeters

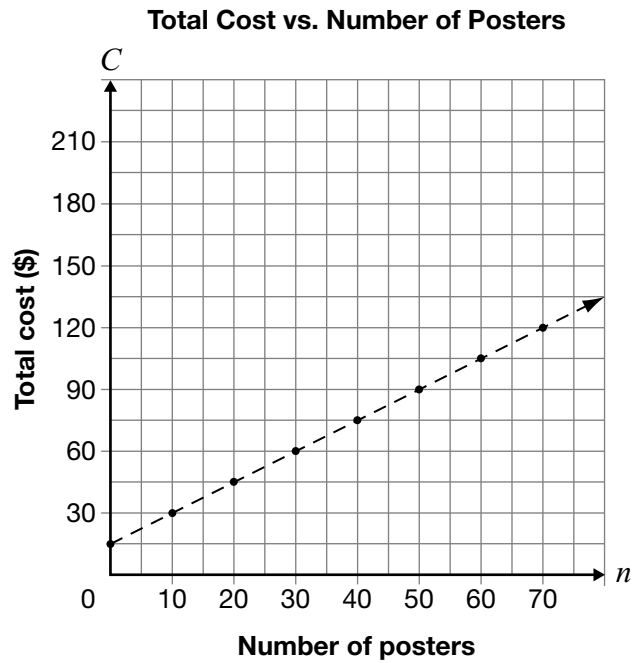
Length	Approximate Area of the Triangle
1 cm	6 cm <sup>2</sup>
3 cm	16 cm <sup>2</sup>
6 cm	25 cm <sup>2</sup>
10 cm	24 cm <sup>2</sup>
11 cm	19 cm <sup>2</sup>

Which graph best represents the relationship between the base length and the area of the triangle?



**15 Poster Printing**

The total cost to print posters includes a set-up fee plus a charge per poster. The graph below represents the relationship between  $C$ , the total cost, and  $n$ , the number of posters printed.



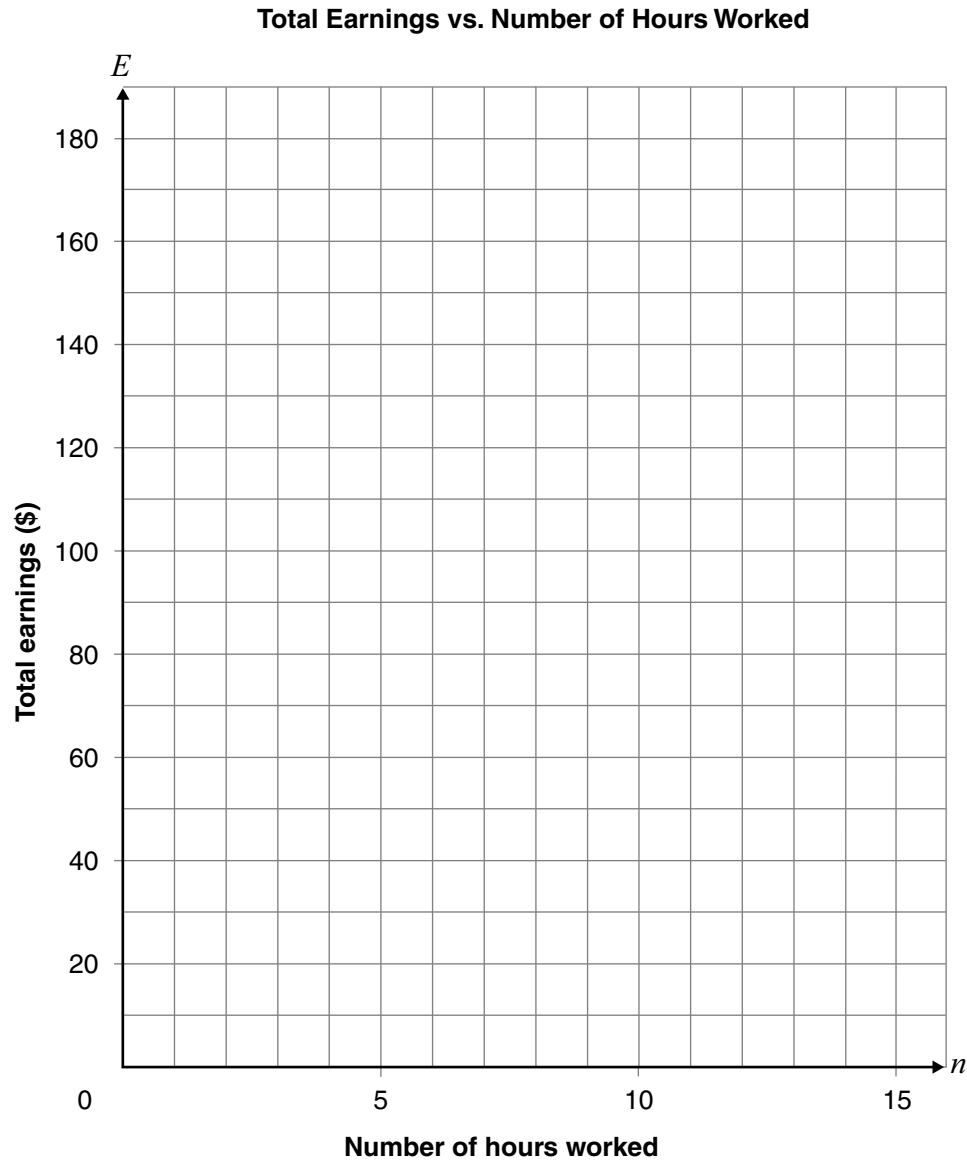
Determine the charge per poster.

Show your work.

**16 Part-Time Jobs**

Liz's new job offers a one-time bonus of \$30 and an hourly pay rate of \$10 per hour. Alex has a new job that pays \$15 per hour.

Graph each person's total earnings on the grid below. Label each line.

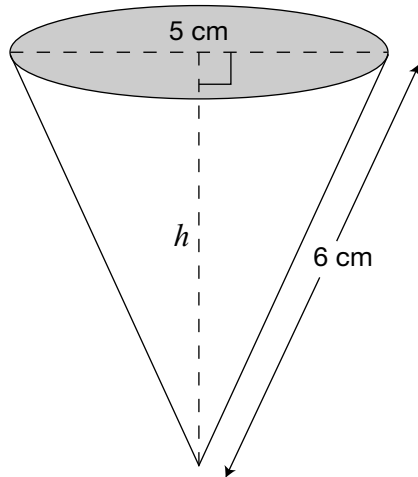


Determine where the lines intersect.

The lines intersect at \_\_\_\_\_.

What does this point represent?

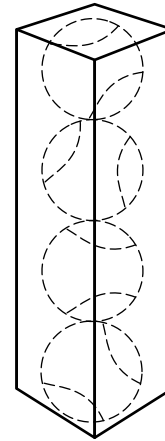
- 17** A cone-shaped water cup is shown below.



Which of the following is closest to the height of the cup,  $h$ ?

- a 3.3 cm
- b 3.5 cm
- c 5.5 cm
- d 8.5 cm

- 18** Tennis Inc. has decided to package 4 tennis balls in a box shaped like a rectangular prism. Tennis balls have a radius of 5 cm.

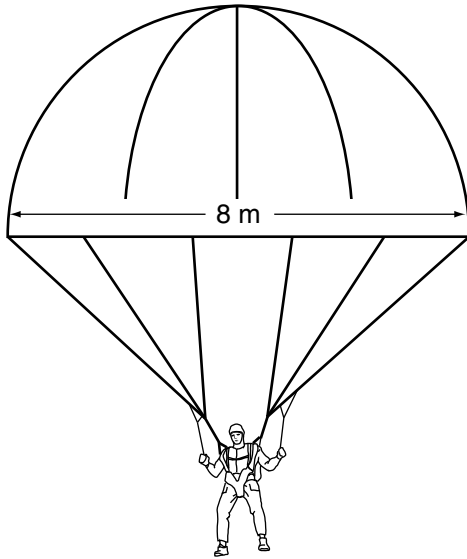


Which set of dimensions would tightly fit 4 tennis balls?

- a  $5\text{ cm} \times 5\text{ cm} \times 20\text{ cm}$
- b  $5\text{ cm} \times 5\text{ cm} \times 40\text{ cm}$
- c  $10\text{ cm} \times 10\text{ cm} \times 10\text{ cm}$
- d  $10\text{ cm} \times 10\text{ cm} \times 40\text{ cm}$

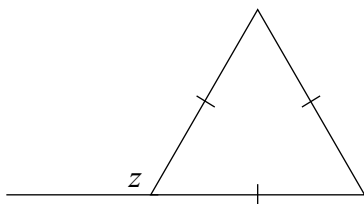


- 19** A fully opened parachute is shaped like a hemisphere and has a diameter of 8 m, as shown below.



Which of the following is closest to the volume of air that can fit in the fully opened parachute?

- a  $134 \text{ m}^3$
  - b  $268 \text{ m}^3$
  - c  $1072 \text{ m}^3$
  - d  $2145 \text{ m}^3$
- 20** What is the value  $z$  in the diagram below?

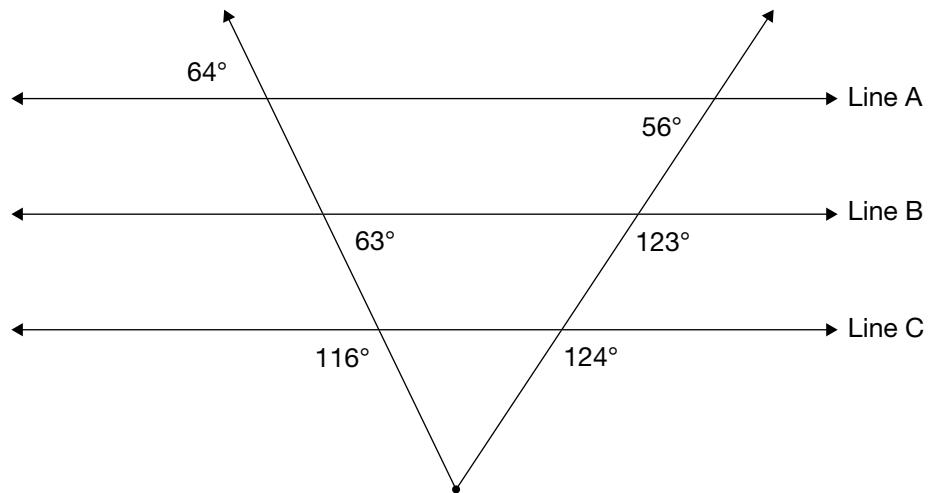


- a  $60^\circ$
- b  $100^\circ$
- c  $120^\circ$
- d  $140^\circ$



**21 Parallel Illusions**

Often lines that look parallel are not parallel.



Which two lines in the diagram above are parallel?

Justify your answer using geometric properties.

**Education Quality and  
Accountability Office**



2 Carlton Street, Suite 1200, Toronto ON M5B 2M9

Telephone: 1-888-327-7377 Web site: [www.eqao.com](http://www.eqao.com)

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# Sample Assessment Questions: Applied

## Student Answer Sheet

Enter your multiple-choice answers on this sheet.

- To indicate your answer, use an **HB pencil to fill in the circle completely**, as shown below:

**Like this:** ● **Not like this:** ⊗ ✓ ◐ ○

- If you fill in more than one answer to a question, the question will be scored incorrect.
- Cleanly erase any answer you wish to change and fill in the circle for your new answer.

1. (a) (b) (c) (d)
2. (a) (b) (c) (d)
3. (a) (b) (c) (d)
4. (a) (b) (c) (d)
5. (a) (b) (c) (d)
6. Respond in booklet.

7. (a) (b) (c) (d)
8. (a) (b) (c) (d)
9. (a) (b) (c) (d)
10. (a) (b) (c) (d)
11. (a) (b) (c) (d)

12. (a) (b) (c) (d)
13. (a) (b) (c) (d)
14. (a) (b) (c) (d)
15. Respond in booklet.
16. Respond in booklet.

17. (a) (b) (c) (d)
18. (a) (b) (c) (d)
19. (a) (b) (c) (d)
20. (a) (b) (c) (d)
21. Respond in booklet.

**End of Assessment**

Print Student Name: \_\_\_\_\_

Student Signature: \_\_\_\_\_

# Applied

## Grade 9 Assessment of Mathematics

Spring 2009

### **SAMPLE ASSESSMENT QUESTIONS**

**Record your answers to the multiple-choice questions  
on the blank Student Answer Sheet (Spring 2009, Applied).**

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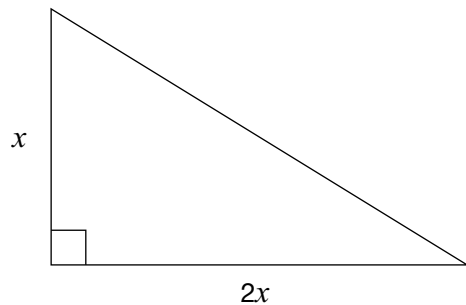
- 1** Darwin is making a drink that is a mix of crystals and water in a ratio of 2:5.

Darwin starts by mixing 4 cups of crystals with 9 cups of water.

How many more cups of water should he add to have a 2:5 ratio?

- a 0
- b 1
- c 2
- d 10

- 2** A gardener designs a rose bed in the shape of a right triangle. The ratio of the two shorter sides is 2:1.



If the area is 25 square units, what are the dimensions of the shorter sides?

Hint:  $A = \frac{bh}{2}$

- a 1, 2
- b 1, 3
- c 5, 5
- d 5, 10

- 3** What is a simplified form of the expression  $2x - 3 - 5x + 1$ ?

- a  $3x - 2$
- b  $3x + 2$
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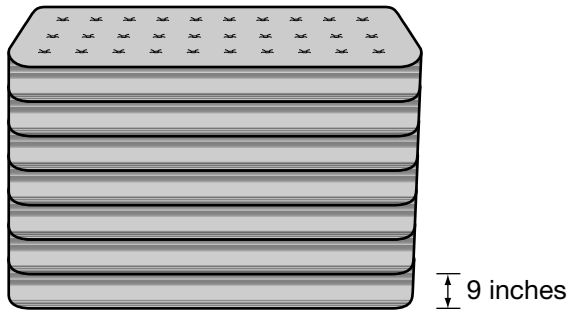
- 4** What is the value of  $x$  that satisfies the equation  $4x - 9 = 2x + 3$ ?

- a 2
- b 3
- c 5
- d 6



**5 Stacked High**

A mattress company has 7000 mattresses to sell. The company claims that if all the mattresses are stacked on top of each other, the stack will be 3 times the height of the CN Tower.

**Hint:**

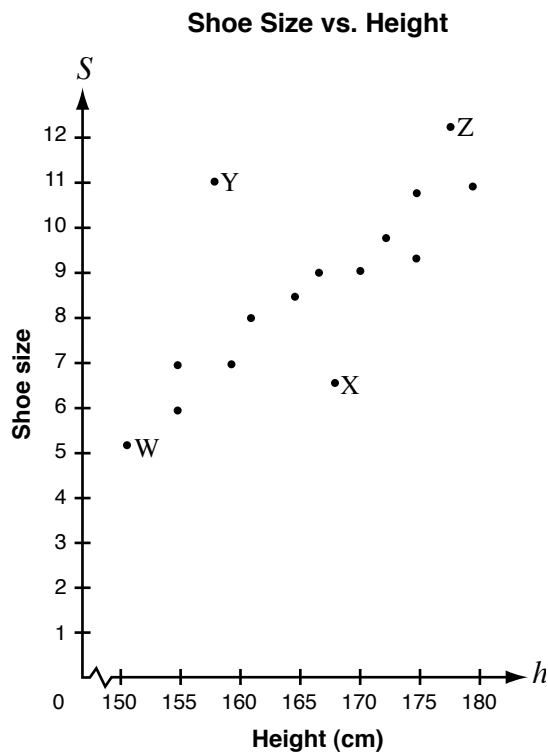
$$1 \text{ inch} = 2.5 \text{ cm}$$

$$1 \text{ m} = 100 \text{ cm}$$

The height of the CN Tower is 553 m and each mattress is 9 inches high. Is the company's claim true?

Justify your answer.

- 6** The graph shows the shoe sizes of girls of various heights.



Which point represents a girl whose shoe size is smaller than expected for a girl of her height?

- a W
- b X
- c Y
- d Z

- 7** Ali collects data to investigate how the area of the wall lit by an overhead projector increases as the projector moves away from the wall. The chart below shows Ali's data.

Distance from the wall (m)	Area on the wall (m <sup>2</sup> )
1	1
2	4
3	9
4	16

Which of the following trends does the data support?

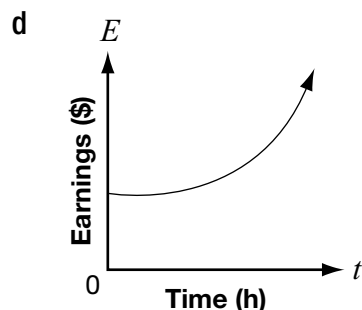
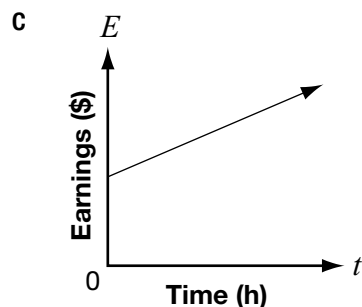
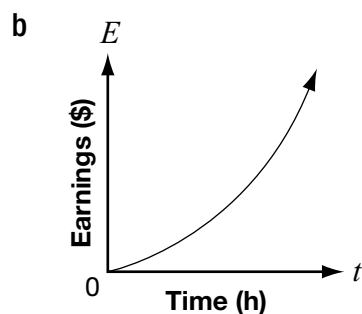
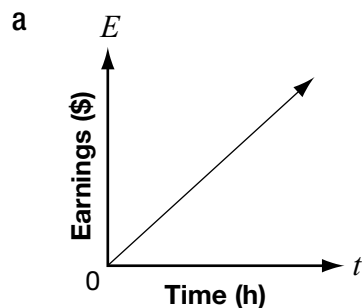
As the distance increases, the area

- a increases at a constant rate.
- b decreases at a constant rate.
- c increases at an increasing rate.
- d decreases at an increasing rate.



- 8** Koshen is creating his own summer gardening job. For each garden, he will charge a \$10 initial consultation fee plus \$8 per hour.

Which graph best represents Koshen's earnings for each garden?



- 9** Which of the following tables represents a non-linear relation?

**a**

$n$	$C$
0	7
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**b**

$n$	$C$
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4	4

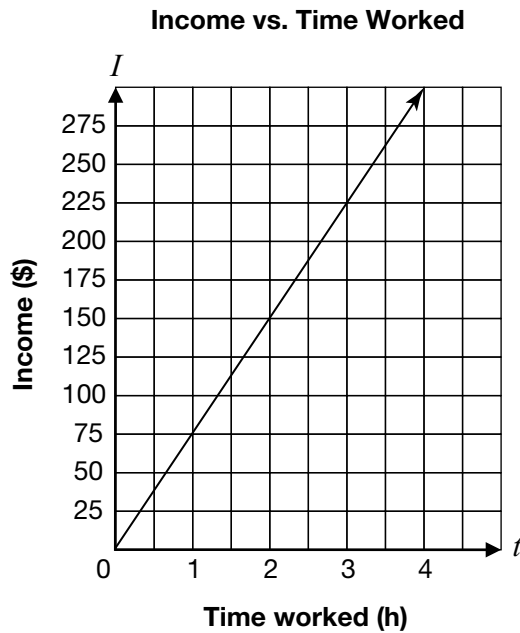
**c**

$n$	$C$
0	12
2	10
4	8
6	6
8	4

**d**

$n$	$C$
0	1
1	2
2	4
3	7
4	11

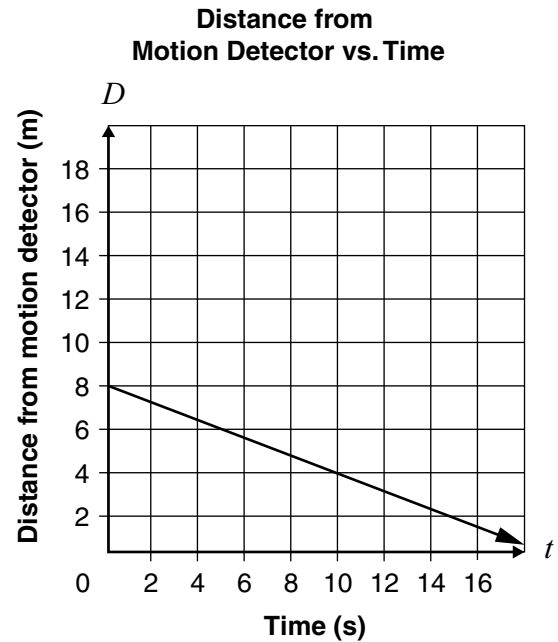
- 10** Joe owns an auto-repair shop. He charges his customers an hourly rate for repairs. The relationship between his income and the amount of time he works is shown below.



What is Joe's hourly rate?

- a \$25/hour
- b \$75/hour
- c \$150/hour
- d \$225/hour

- 11** The graph below shows the relationship between Rick's distance from a motion detector and the time he walks.



Which equation represents Rick's distance,  $D$ , from the motion detector based on time,  $t$ ?

- a  $D = -\frac{2}{5}t + 8$
- b  $D = \frac{2}{5}t + 8$
- c  $D = -\frac{5}{2}t + 8$
- d  $D = \frac{5}{2}t + 8$

- 12** The cost,  $C$ , in dollars of producing  $n$  yearbooks is represented by the equation

$$C = 1000 + 5n.$$

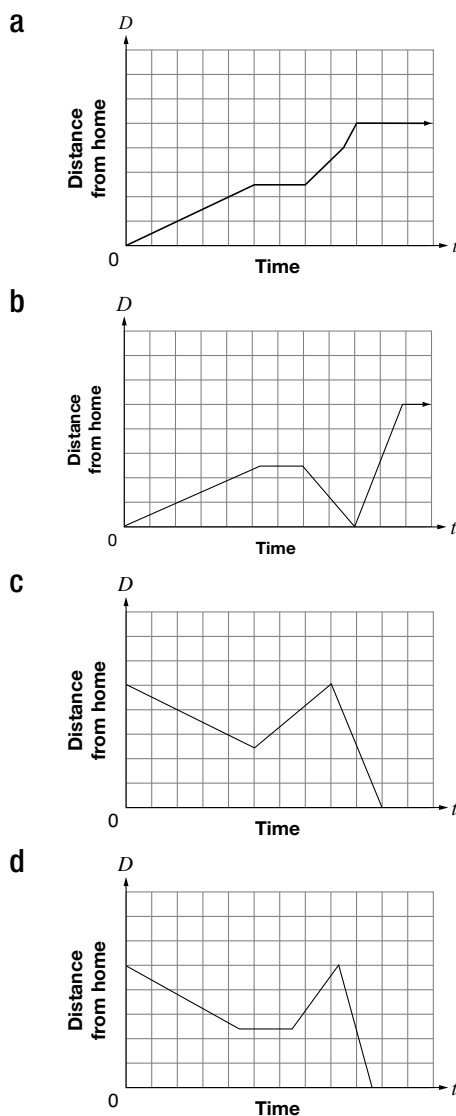
How much would it cost to produce 75 yearbooks?

- a \$375
- b \$625
- c \$1000
- d \$1375

**13** **Maya's Trip to School**

- Maya walks to her friend Kadeem's house, which is halfway between her home and the school.
- They stay at Kadeem's house for a few minutes, until Maya remembers that she has forgotten her lunch.
- Maya runs back home to get her lunch.
- When she gets home, her mother drives her to school so that she will not be late.

Which graph most accurately represents Maya's trip to school?

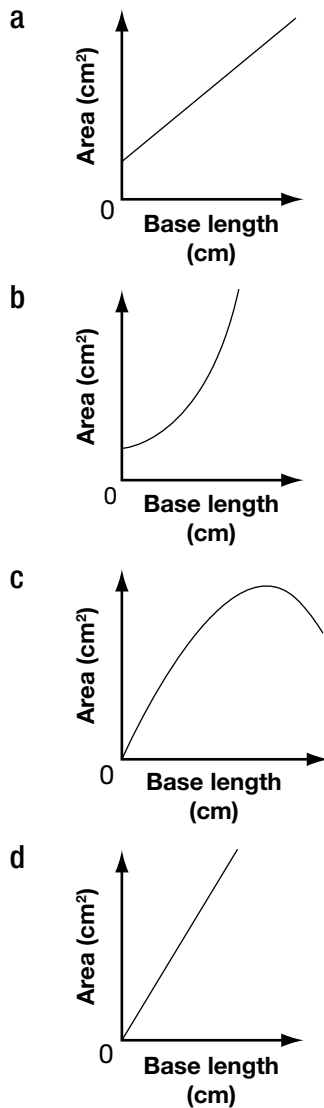


- 14** The data for five isosceles triangles with perimeters of 24 cm are shown below.

Triangles With 24 cm Perimeters

Length	Approximate Area of the Triangle
1 cm	6 cm <sup>2</sup>
3 cm	16 cm <sup>2</sup>
6 cm	25 cm <sup>2</sup>
10 cm	24 cm <sup>2</sup>
11 cm	19 cm <sup>2</sup>

Which graph best represents the relationship between the base length and the area of the triangle?



**15 Ripples in the Pond**

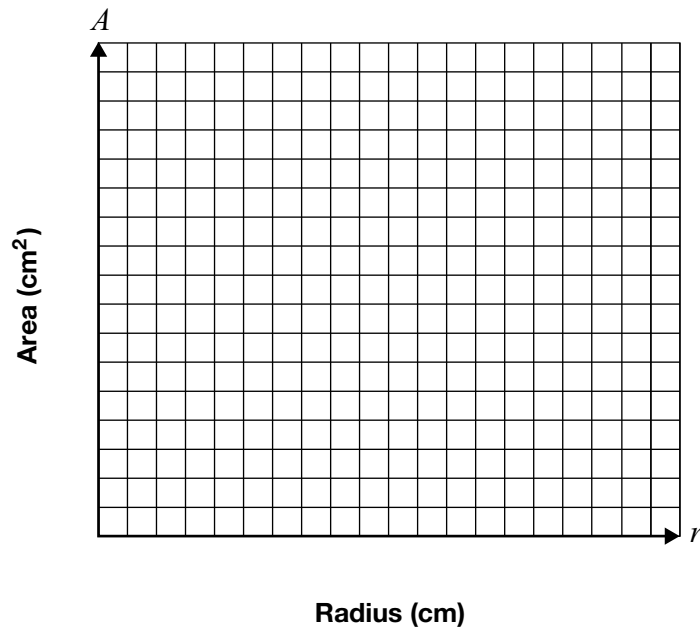
Quinn drops a pebble into a shallow pond and watches a circular wave ripple outward. The area of the circle increases as the radius increases.

Complete the table.

Radius (cm)	Area (cm <sup>2</sup> )
0	
1	
2	
3	
4	
5	

Hint: Area of circle =  $\pi r^2$

Graph these data below. Choose and label an appropriate scale for each axis.



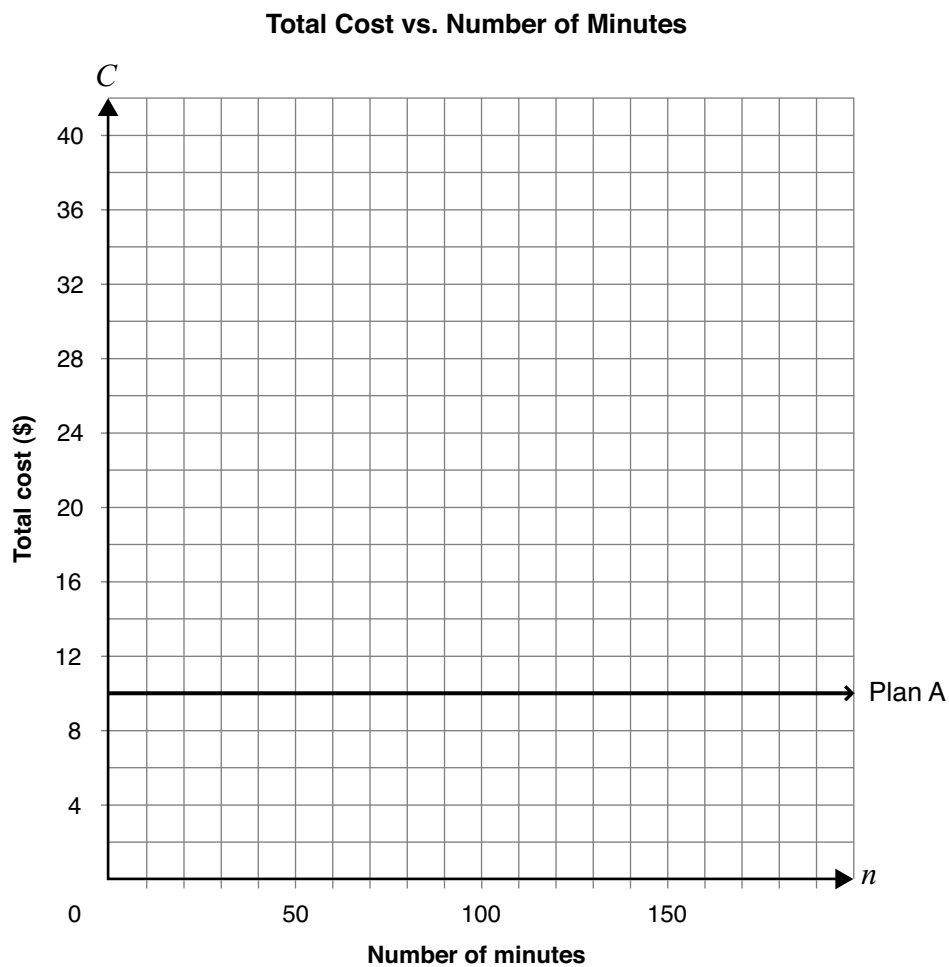
Draw a line or curve of best fit.

**16 I'll Call You**

Jasdeep has two options for long-distance phone calls.

- Plan A, as shown on the graph below, charges \$10.00 per month for unlimited minutes.
- Plan B charges \$0.20 per minute with no initial fee.

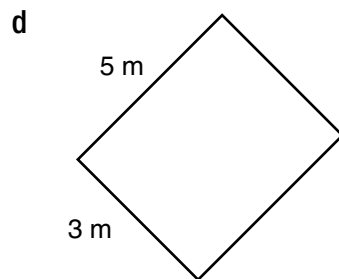
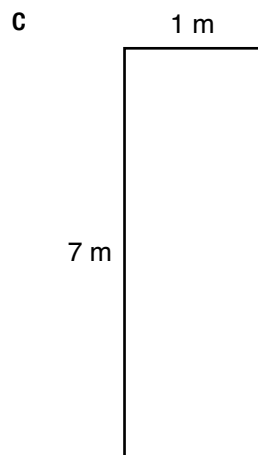
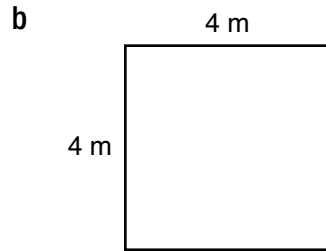
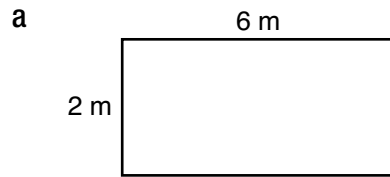
Graph Plan B on the grid below.



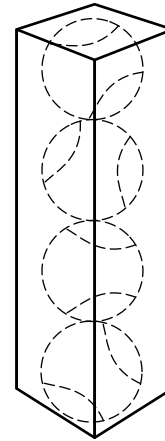
Determine under which conditions Jasdeep should select each plan.

Justify your answer.

- 17** Which of the following rectangles provides the maximum area for a perimeter of 16 m?



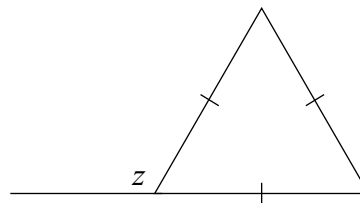
- 18** Tennis Inc. has decided to package 4 tennis balls in a box shaped like a rectangular prism. Tennis balls have a radius of 5 cm.



Which set of dimensions would tightly fit 4 tennis balls?

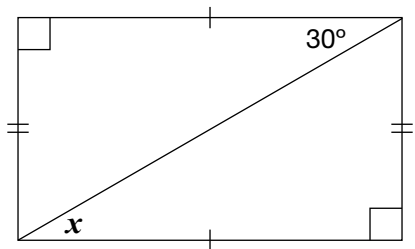
- a** 5 cm  $\times$  5 cm  $\times$  20 cm
- b** 5 cm  $\times$  5 cm  $\times$  40 cm
- c** 10 cm  $\times$  10 cm  $\times$  10 cm
- d** 10 cm  $\times$  10 cm  $\times$  40 cm

- 19** What is the value  $z$  in the diagram below?



- a**  $60^\circ$
- b**  $100^\circ$
- c**  $120^\circ$
- d**  $140^\circ$

- 20** Consider the diagram below.



What is the value of  $x$  in the diagram?

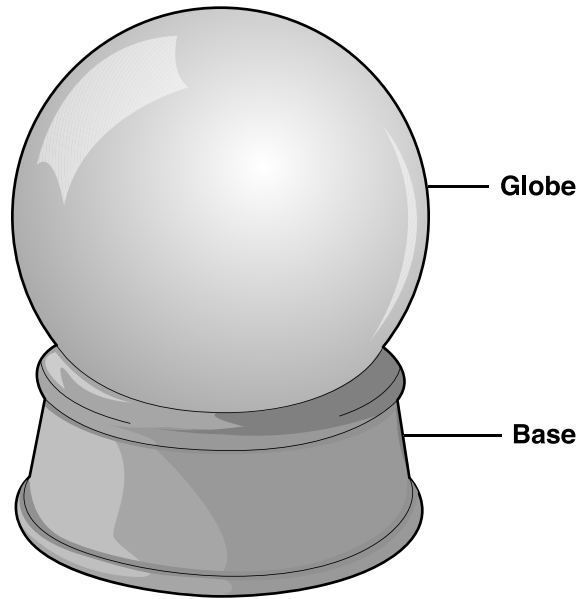
- a  $150^\circ$
- b  $90^\circ$
- c  $60^\circ$
- d  $30^\circ$





**21 Global Gift Shop**

A gift shop sells water-filled spherical globes that sit on bases.



There are two sizes to choose from.

- A small globe has a radius of 6 cm.
- A large globe has a radius of 18 cm.

Mary thinks that the volume of water contained by the large globe is about three times the volume of water in the small globe.

Is she correct?

Circle one:      Yes                  No

Justify your answer.

# Sample Assessment Questions: Applied

## Student Answer Sheet

Enter your multiple-choice answers on this sheet.

- To indicate your answer, use an **HB pencil to fill in the circle completely**, as shown below:

**Like this:** ● **Not like this:** ⊗ ✓ ◐ ○

- If you fill in more than one answer to a question, the question will be scored incorrect.
- Cleanly erase any answer you wish to change and fill in the circle for your new answer.

1. (a) (b) (c) (d)
2. (a) (b) (c) (d)
3. (a) (b) (c) (d)
4. (a) (b) (c) (d)
5. Respond in booklet.
6. (a) (b) (c) (d)

7. (a) (b) (c) (d)
8. (a) (b) (c) (d)
9. (a) (b) (c) (d)
10. (a) (b) (c) (d)
11. (a) (b) (c) (d)

12. (a) (b) (c) (d)
13. (a) (b) (c) (d)
14. (a) (b) (c) (d)
15. Respond in booklet.
16. Respond in booklet.

17. (a) (b) (c) (d)
18. (a) (b) (c) (d)
19. (a) (b) (c) (d)
20. (a) (b) (c) (d)
21. Respond in booklet.

**End of Assessment**

Print Student Name: \_\_\_\_\_

Student Signature: \_\_\_\_\_

# Applied

## Grade 9 Assessment of Mathematics

Winter 2008

### **SAMPLE ASSESSMENT QUESTIONS**

**Record your answers to the multiple-choice questions  
on the blank Student Answer Sheet (Winter 2008, Applied).**

Education Quality and  
Accountability Office



Please note: The format of these booklets is slightly different from that used for the assessment. The items themselves remain the same.

- 1** A carton that holds 500 mL of chocolate milk costs \$2.29.

Which of the following containers has a lower cost per mL?

- a 250 mL at \$1.29
- b 700 mL at \$3.09
- c 750 mL at \$3.59
- d 1000 mL at \$4.69

- 2** Which of the following fractions is **not** equivalent to  $\frac{10}{30}$ ?

- a  $\frac{2}{6}$
- b  $\frac{15}{35}$
- c  $\frac{1}{3}$
- d  $\frac{100}{300}$

- 3** Aidan is buying a new CD player. The CD player was selling for \$84.79 and now is on sale for 25% off. Which of the following is closest to the total cost of the CD player, including 15% sales tax?

- a \$54.05
- b \$63.59
- c \$73.13
- d \$74.49

- 4** What is the value of the expression

$$-1 + \frac{77}{100}?$$

- a  $-\frac{177}{100}$
- b  $-\frac{78}{100}$
- c  $-\frac{76}{100}$
- d  $-\frac{23}{100}$

- 5** The volume of a cylinder is  $325 \text{ cm}^3$ . The height is 8.5 cm.

Which is closest to the measure of the radius?

Hint:  $V = \pi r^2 h$

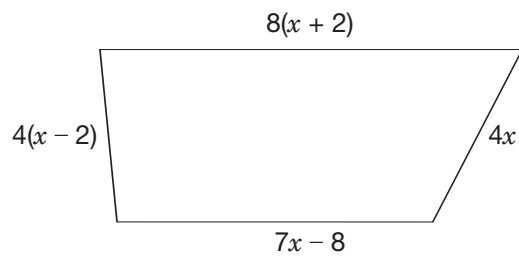
- a 3.49 cm
- b 6.09 cm
- c 12.17 cm
- d 38.24 cm

- 6** What is the solution to the equation  $3x + 80 = 12x - 1$ ?

- a -27
- b -9
- c 9
- d 27

**7 Field Maintenance**

A field in the shape of a trapezoid has a perimeter of 460 m. A fence is being built along the field's perimeter.

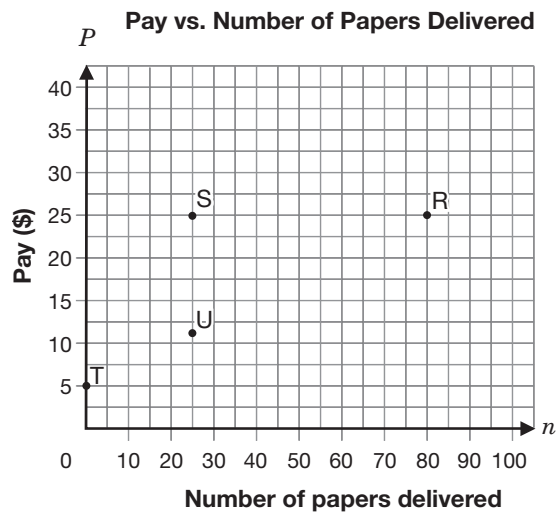


Determine the length of fencing needed for each side of the field.

Show your work.



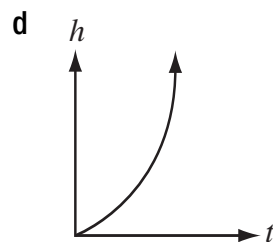
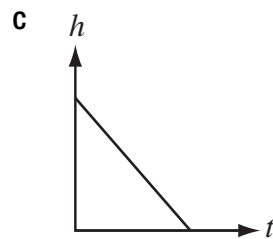
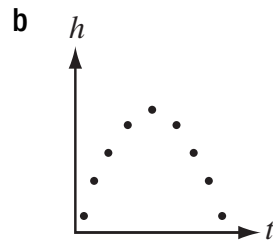
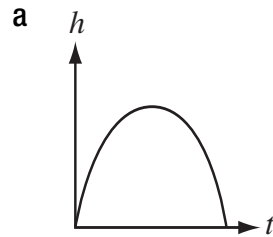
- 8** Mia delivers the local newspaper. Her base pay is \$5 per week, and she gets \$0.25 per paper.



Which of the points on the graph represents Mia's pay for delivering 25 newspapers in a week?

- a Point R
- b Point S
- c Point T
- d Point U

- 9** Which of the following graphs represents a linear relation?



- 10** Simon records the height of a plant each day for five days.

**Plant Growth Over Five Days**

Day	Height (cm)
0	4
1	5
2	7
3	10
4	14

His chart shows that the relation between height and day

- a** is a linear relation.
- b** is a non-linear relation.
- c** has a constant rate of change.
- d** has a decreasing rate of change.

- 11** Victoria is selling chocolate bars to raise money for her hockey team. She begins with 36 bars to sell and sells four bars per day.

Which of the following represents the relation between  $N$ , the number of chocolate bars remaining, and  $d$ , the number of days she has been selling?

- a**  $N = 36 + 4d$
- b**  $N = 36d - 4$

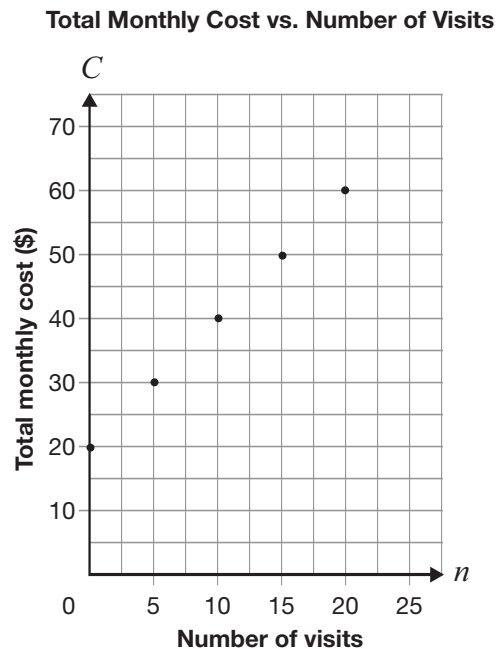
**c**

Day, $d$	Number of bars remaining, $N$	First differences
0	20	
1	24	4
2	28	4
3	32	4
4	36	4

**d**

Day, $d$	Number of bars remaining, $N$	First differences
0	36	
1	32	-4
2	28	-4
3	24	-4
4	20	-4

- 12** Tyler belongs to a fitness club at the community centre. The graph below represents the relationship between the number of times he visits the club and his total monthly cost.



What type of variation is this relationship, and what is the initial value?

- a** Direct variation, and initial value is 0
- b** Partial variation, and initial value is 0
- c** Direct variation, and initial value is 20
- d** Partial variation, and initial value is 20

- 13** A tap is leaking into a pail. The height of the water in the pail is represented by the equation  $h = 0.5t + 2$ , where  $h$  represents the height of water in the pail, in cm, and  $t$  represents the amount of time the tap has been leaking, in minutes.

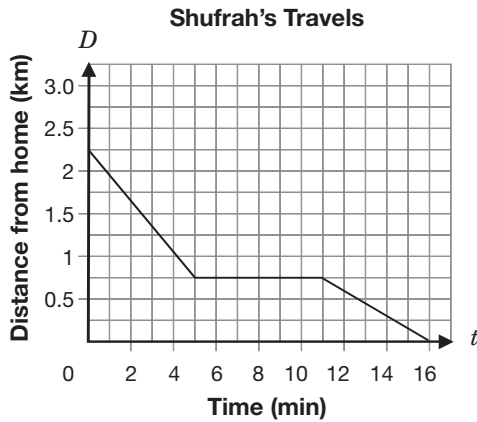
What is the height of water in the pail if the tap has been leaking for 56 minutes?

- a** 28 cm
- b** 30 cm
- c** 108 cm
- d** 114 cm





- 14** The relationship between  $t$ , the number of minutes Shufrah travels, and  $D$ , the distance she is from home, is shown on the grid below.



Which of the following statements best describes the way Shufrah travels?

- a While travelling toward her home, Shufrah rides her bike, stops and then walks.
- b While travelling toward her home, Shufrah rides her bike, walks and then rides her bike.
- c While travelling away from home, Shufrah rides her bike, stops and then walks.
- d While travelling away from home, Shufrah walks, rides her bike and then walks.



15 Makin’ a Profit!

Student council is planning a dance.

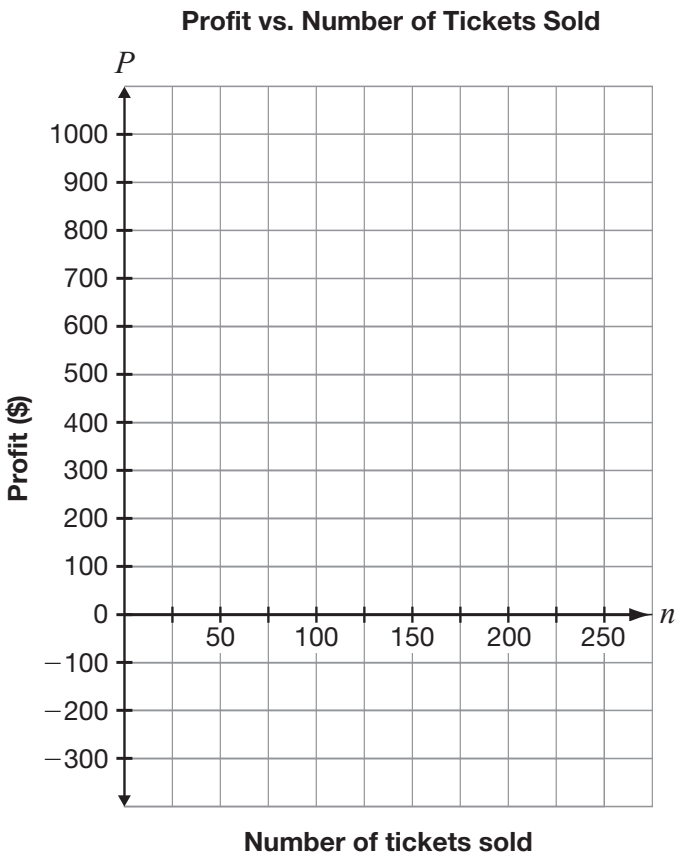
- The cost to hire a DJ is \$300.
- Tickets are sold at \$6 each.
- The profit is based on the amount received from the tickets sold minus the cost of the DJ.

Complete the table of values to show the profit based on the number of tickets sold.

Profit from Ticket Sales

Number of tickets sold	Profit (\$)
0	
50	
100	
150	
200	

Graph these data on the grid below.



**16 Rockin' Radicals**

The Radicals, a small high school band, recently signed a contract with a record label. Their earnings include a signing bonus plus an amount per CD sold, as shown in the table below.

Number of CDs	Band earnings (\$)
0	10 000
5 000	10 600
10 000	11 200
15 000	11 800
20 000	12 400

Determine the amount of the signing bonus and the amount they receive per CD.

Show your work.

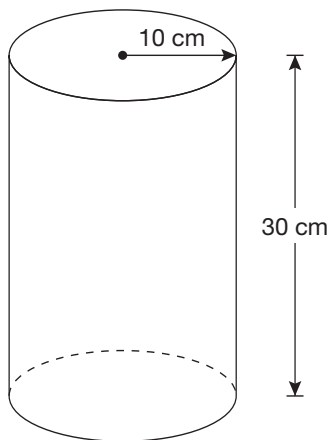


- 17** Germaine wants to calculate the area of the shape shown below. It is composed of a rectangle and two semicircles.



Which of the following pairs of expressions should Germaine use to determine the area of the shape?

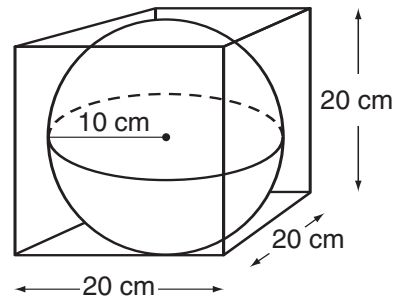
- a  $2(l + w), \pi r^2$
  - b  $2(l + w), 2\pi r$
  - c  $lw, 2\pi r$
  - d  $lw, \pi r^2$
- 18** Silvia is making lemonade. She is using a cylindrical container with a radius of 10 cm and a height of 30 cm, as shown below.



Which of the following is closest to the volume of the container?

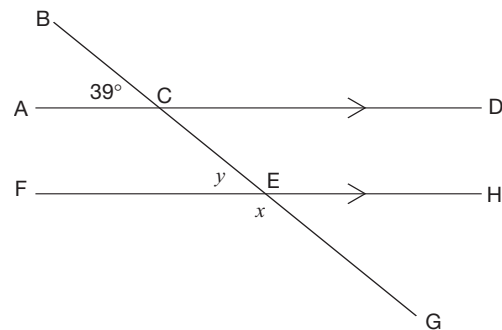
- a 37 700 cm<sup>3</sup>
- b 9425 cm<sup>3</sup>
- c 1885 cm<sup>3</sup>
- d 600 cm<sup>3</sup>

- 19** A soccer ball is packaged in a cube-shaped box.



Which is closest to the volume of the space in the package that is **not** occupied by the ball?

- a 3811 cm<sup>3</sup>
  - b 4000 cm<sup>3</sup>
  - c 4187 cm<sup>3</sup>
  - d 8000 cm<sup>3</sup>
- 20** The measure of  $\angle ACB$  is  $39^\circ$ .

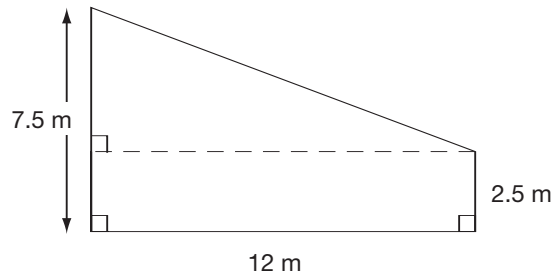


What are the values of  $x$  and  $y$ ?

- a  $x = 39^\circ$  and  $y = 141^\circ$
- b  $x = 39^\circ$  and  $y = 39^\circ$
- c  $x = 141^\circ$  and  $y = 141^\circ$
- d  $x = 141^\circ$  and  $y = 39^\circ$

**21 Paint**

Jackson is buying paint for his wall.



One litre of paint will cover  $9 \text{ m}^2$ .

How many litres of paint does he need to cover the wall?

Justify your answer.

# Sample Assessment Questions: Applied

## Student Answer Sheet

Enter your multiple-choice answers on this sheet.

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4. (a) (b) (c) (d)
5. (a) (b) (c) (d)
6. (a) (b) (c) (d)

7. Respond in booklet.

8. (a) (b) (c) (d)
9. (a) (b) (c) (d)
10. (a) (b) (c) (d)
11. (a) (b) (c) (d)

12. (a) (b) (c) (d)

13. (a) (b) (c) (d)

14. (a) (b) (c) (d)

15. Respond in booklet.

16. Respond in booklet.

17. (a) (b) (c) (d)

18. (a) (b) (c) (d)

19. (a) (b) (c) (d)

20. (a) (b) (c) (d)

21. Respond in booklet.

**End of Assessment**

Print Student Name: \_\_\_\_\_

Student Signature: \_\_\_\_\_

# Applied

## Grade 9 Assessment of Mathematics

Spring 2008

### **SAMPLE ASSESSMENT QUESTIONS**

**Record your answers to the multiple-choice questions  
on the blank Student Answer Sheet (Spring 2008, Applied).**

Education Quality and  
Accountability Office



Please note: The format of these booklets is slightly different from that used for the assessment. The items themselves remain the same.

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Which of the following containers has a lower cost per mL?

- a 250 mL at \$1.29
- b 700 mL at \$3.09
- c 750 mL at \$3.59
- d 1000 mL at \$4.69

- 2** Which of the following fractions is **not** equivalent to  $\frac{10}{30}$ ?

- a  $\frac{2}{6}$
- b  $\frac{15}{35}$
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- 3** Aidan is buying a new CD player. The CD player was selling for \$84.79 and now is on sale for 25% off. Which of the following is closest to the total cost of the CD player, including 15% sales tax?

- a \$54.05
- b \$63.59
- c \$73.13
- d \$74.49

- 4** What is the value of the expression

$$-1 + \frac{77}{100}?$$

- a  $-\frac{177}{100}$
- b  $-\frac{78}{100}$
- c  $-\frac{76}{100}$
- d  $-\frac{23}{100}$

- 5** A rocket is fired upward from the ground. The equation below shows the relationship between  $h$ , the height of the rocket above the ground in metres, and  $t$ , the time in seconds.

$$h = 60t - 5t^2$$

Which of the following is the height of the rocket after 4 seconds?

- a 35 m
- b 44 m
- c 160 m
- d 240 m

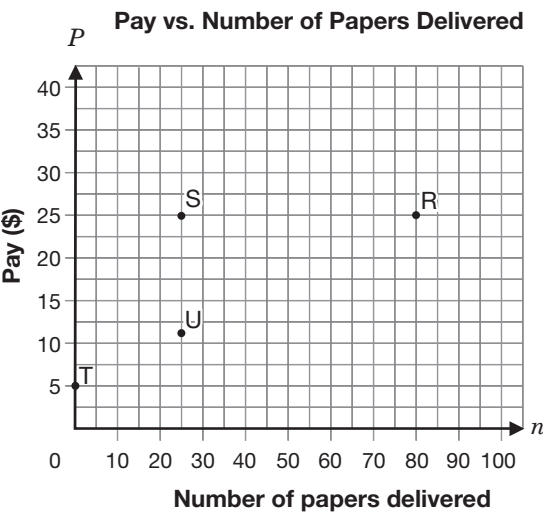


**6 Clarence's Quandary**

Clarence works at a veterinarian's office. He needs to give a dose of medicine to a 24 kg dog. The recommended dosage for a dog that weighs 10 kg is 25 mL. Determine the dose Clarence should give to the 24 kg dog if the rate remains the same. Show your work.



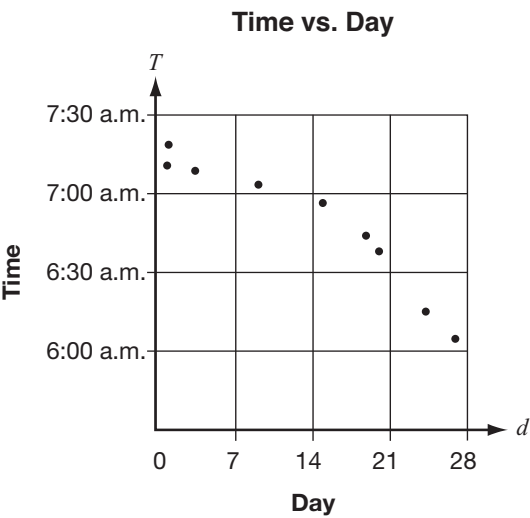
- 7** Mia delivers the local newspaper. Her base pay is \$5 per week, and she gets \$0.25 per paper.



Which of the points on the graph represents Mia’s pay for delivering 25 newspapers in a week?

- a Point R
- b Point S
- c Point T
- d Point U

- 8** Yves records the time of day that a street light turns off for 9 mornings over 28 days. The graph shows his data from the first day of the month.



Which statement describes the relation above?

- a The later in the month, the later the street light turns off.
- b The later in the month, the earlier the street light turns off.
- c The earlier in the month, the earlier the street light turns off.
- d There is no relationship between the day and the time the street light turns off.

- 9** Victoria is selling chocolate bars to raise money for her hockey team. She begins with 36 bars to sell and sells four bars per day.

Which of the following represents the relation between  $N$ , the number of chocolate bars remaining, and  $d$ , the number of days she has been selling?

- a  $N = 36 + 4d$   
b  $N = 36d - 4$

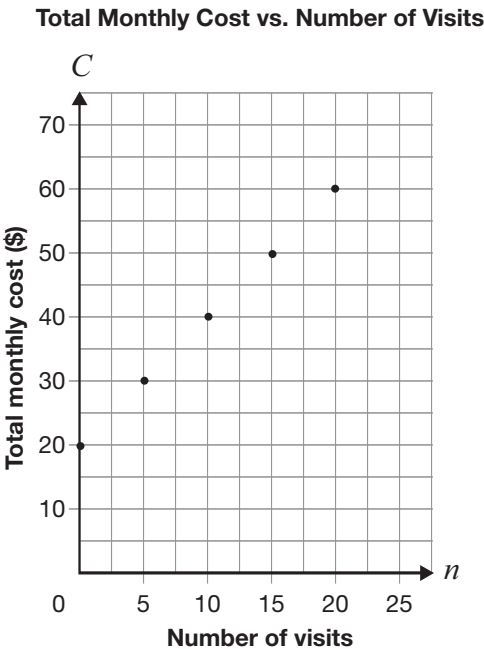
c

Day, $d$	Number of bars remaining, $N$	First differences
0	20	
1	24	4
2	28	4
3	32	4
4	36	4

d

Day, $d$	Number of bars remaining, $N$	First differences
0	36	
1	32	-4
2	28	-4
3	24	-4
4	20	-4

- 10** Tyler belongs to a fitness club at the community centre. The graph below represents the relationship between the number of times he visits the club and his total monthly cost.



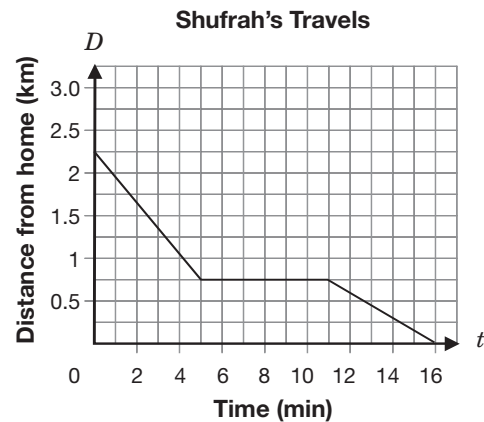
What type of variation is this relationship, and what is the initial value?

- a Direct variation, and initial value is 0  
b Partial variation, and initial value is 0  
c Direct variation, and initial value is 20  
d Partial variation, and initial value is 20

- 11** Karl joins a fitness centre. The cost includes a one-time fee of \$100 plus a monthly fee of \$30. If  $C$  represents his total cost and  $n$  is the number of months, which equation represents this relationship?

- a  $C = 130n$
- b  $C = 100n + 30$
- c  $C = 30n + 100$
- d  $C = n + 130$

- 12** The relationship between  $t$ , the number of minutes Shufrah travels, and  $D$ , the distance she is from home, is shown on the grid below.



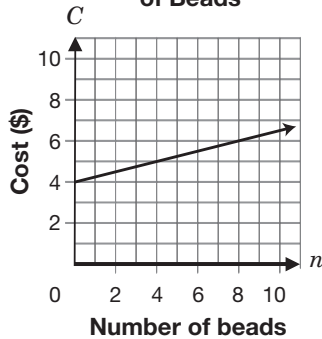
Which of the following statements best describes the way Shufrah travels?

- a While travelling toward her home, Shufrah rides her bike, stops and then walks.
- b While travelling toward her home, Shufrah rides her bike, walks and then rides her bike.
- c While travelling away from home, Shufrah rides her bike, stops and then walks.
- d While travelling away from home, Shufrah walks, rides her bike and then walks.

- 13** A jewellery store sells bead necklaces. Each necklace costs \$4 for the wire and \$0.25 per bead.

Select the answer below that represents this relation **correctly** in two ways.  $C$  is the cost in dollars and  $n$  is the number of beads.

**a** Cost vs. Number of Beads



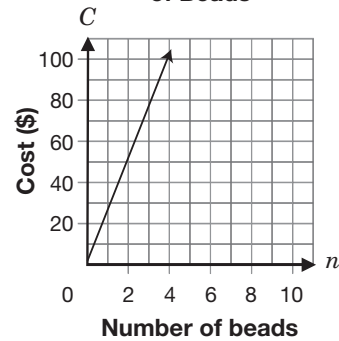
Number of beads, $n$	Cost, $C$ \$
0	0
5	1.25
10	2.50
15	3.75
20	5.00

**b**  $C = 4n + 0.25$

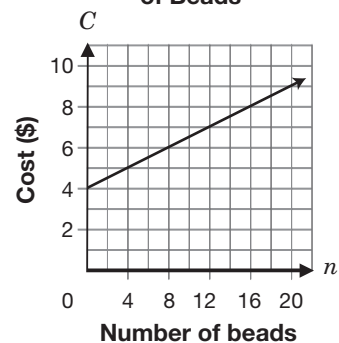
Number of beads, $n$	Cost, $C$ \$
0	4.00
5	5.25
10	6.50
15	7.75
20	9.00

**c**  $C = 0.25n + 4$

Cost vs. Number of Beads



**d** Cost vs. Number of Beads



Number of beads, $n$	Cost, $C$ \$
0	4.00
5	5.25
10	6.50
15	7.75
20	9.00

- 14** U-Rent-Skates charges an \$8 fee, plus \$3.50 per hour to rent skates.

How long can Zara skate if she has a total of \$22 and still needs to keep \$1.50 for bus fare?

- a** 3 hours  
**b** 4 hours  
**c** 5 hours  
**d** 6 hours

**15 Starting Costs**

A car rental company uses the equation  $C = 20 + 0.15d$  to determine the cost of renting a car, where  $C$  is the total cost in dollars and  $d$  is the distance travelled in kilometres.

Determine the initial value and the rate of change.

Initial value \_\_\_\_\_

Rate of change \_\_\_\_\_

Describe how the initial value and the rate of change relate to the total cost of renting a car.



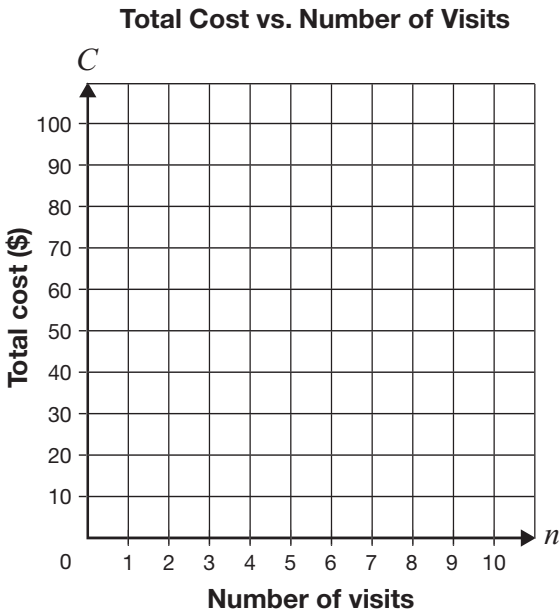
**16 Let’s Go to a Water Park!**

Two water parks have different methods of determining the cost of a season pass. The equations for both parks are given below, where  $C$  is the cost of the pass and  $n$  is the number of visits.

Wet Water World	
$C = 20 + 10n$	
Number of visits, $n$	Total cost, $C$ (\$)
0	
2	
4	
6	
8	

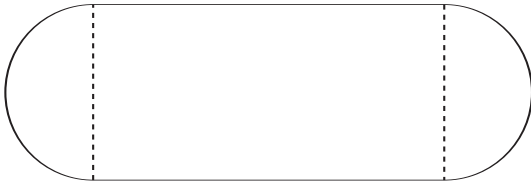
Bubbling Blue	
$C = 50 + 5n$	
Number of visits, $n$	Total cost, $C$ (\$)
0	
2	
4	
6	
8	

Graph the costs for both water parks on the grid below.



Determine which water park has the lower cost for a season pass.  
Justify your answer.

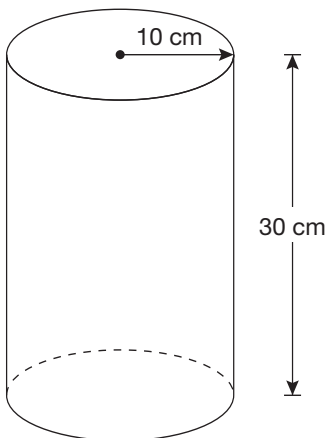
- 17** Germaine wants to calculate the area of the shape shown below. It is composed of a rectangle and two semicircles.



Which of the following pairs of expressions should Germaine use to determine the area of the shape?

- a  $2(l + w), \pi r^2$
- b  $2(l + w), 2\pi r$
- c  $lw, 2\pi r$
- d  $lw, \pi r^2$

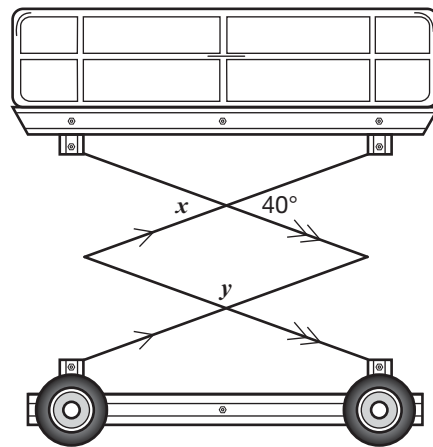
- 18** Silvia is making lemonade. She is using a cylindrical container with a radius of 10 cm and a height of 30 cm, as shown below.



Which of the following is closest to the volume of the container?

- a  $37\,700\text{ cm}^3$
- b  $9425\text{ cm}^3$
- c  $1885\text{ cm}^3$
- d  $600\text{ cm}^3$

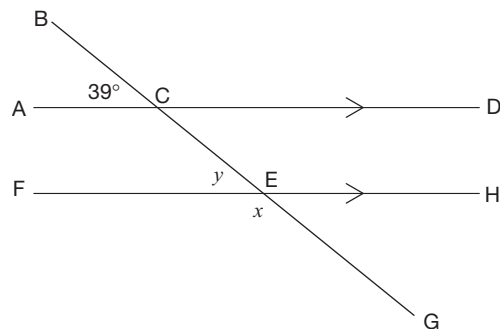
- 19** A custodian uses a lift to change light bulbs in the gym. A cross-section of the lift is shown below.



What are the values of  $x$  and  $y$ ?

- a  $x = 40^\circ, y = 100^\circ$
- b  $x = 40^\circ, y = 140^\circ$
- c  $x = 50^\circ, y = 130^\circ$
- d  $x = 50^\circ, y = 140^\circ$

- 20** The measure of  $\angle ACB$  is  $39^\circ$ .



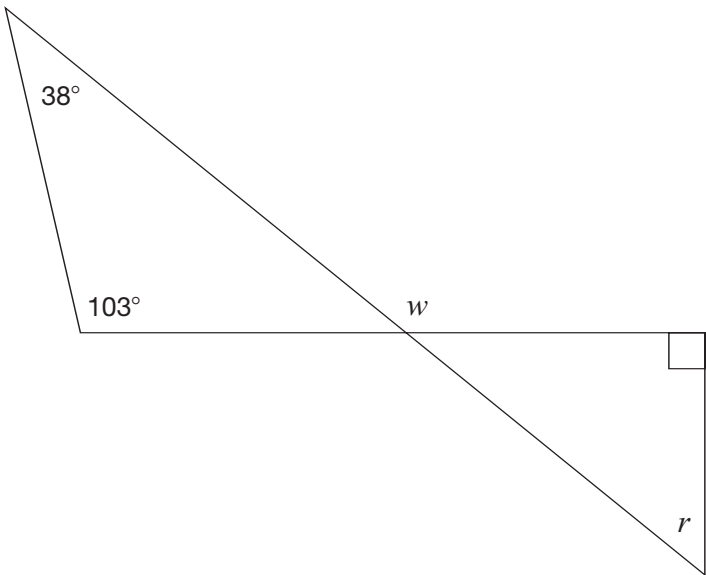
What are the values of  $x$  and  $y$ ?

- a  $x = 39^\circ$  and  $y = 141^\circ$
- b  $x = 39^\circ$  and  $y = 39^\circ$
- c  $x = 141^\circ$  and  $y = 141^\circ$
- d  $x = 141^\circ$  and  $y = 39^\circ$



**21 Determining Degrees**

Consider the following diagram.



Determine the values of  $r$  and  $w$ .

Justify your answer.

	Value	Justification
$r$		
$w$		

## Sample Assessment Questions: Applied

## Student Answer Sheet

Enter your multiple-choice answers on this sheet.

- To indicate your answer, use an **HB pencil to fill in the circle completely**, as shown below:

**Like this:** ● **Not like this:** ⊗ ✓ ◐ ⊙

- If you fill in more than one answer to a question, the question will be scored incorrect.
- Cleanly erase any answer you wish to change and fill in the circle for your new answer.

1. (a) (b) (c) (d)
2. (a) (b) (c) (d)
3. (a) (b) (c) (d)
4. (a) (b) (c) (d)
5. (a) (b) (c) (d)
6. Respond in booklet.

7. (a) (b) (c) (d)
8. (a) (b) (c) (d)
9. (a) (b) (c) (d)
10. (a) (b) (c) (d)
11. (a) (b) (c) (d)

12. (a) (b) (c) (d)
13. (a) (b) (c) (d)
14. (a) (b) (c) (d)
15. Respond in booklet.
16. Respond in booklet.

17. (a) (b) (c) (d)
18. (a) (b) (c) (d)
19. (a) (b) (c) (d)
20. (a) (b) (c) (d)
21. Respond in booklet.

End of Assessment

Print Student Name: \_\_\_\_\_

Student Signature: \_\_\_\_\_

# Applied

## Grade 9 Assessment of Mathematics

Winter 2007

### **SAMPLE ASSESSMENT QUESTIONS**

Circle the best answer for each multiple choice question on the page.  
Answer each open response question in the space provided.

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Please note: The format of these booklets is slightly different from that used for the assessment. The items themselves remain the same.

- 1** The ratio of girls to boys in Mr. Dilworth's music class is 18:12. What percent of the students are boys?

A 12%  
B 40%  
C 60%  
D 67%

- 2** Which of the following expressions is equal to 49?

F  $(4 + 3)^2$   
G  $4 + 3^2$   
H  $(3 + 4^2)$   
J  $3^2 + 4^2$

- 3** Herman uses his scientific calculator to determine the value of the expression  $\frac{4}{3}\pi(3.5)^3$ .

What is the **approximate** value of this expression?

A 175.0  
B 175.1  
C 179.0  
D 179.6

- 4** Ivan shows his steps in solving the following equation for  $x$ :

$$2x + 3 = 7$$

Step 1:  $2x + 3 - 3 = 7 - 3$

Step 2:  $2x = 4$

Step 3:  $x = 4 \times 2$

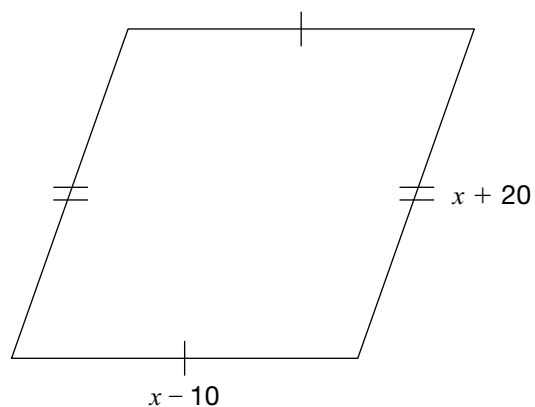
Step 4:  $x = 8$

In which step has Ivan made an **error**?

F Step 1  
G Step 2  
H Step 3  
J Step 4

**5 Fabulous Fencing**

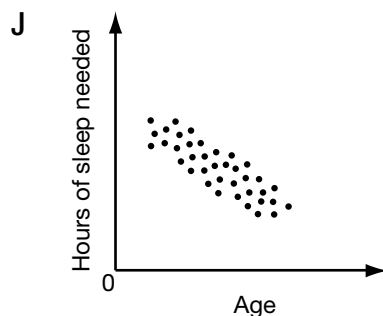
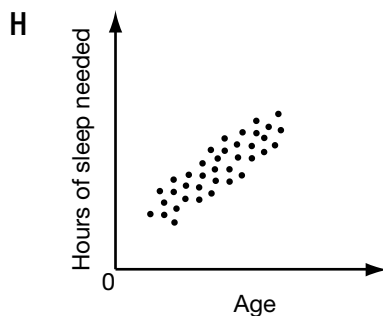
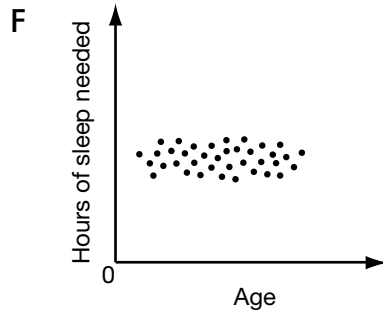
Pauline builds a fence around her garden, which is shaped like a parallelogram, as shown below.



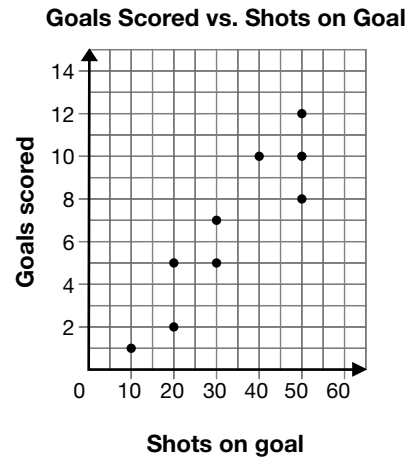
Pauline uses 100 metres of fencing along the perimeter of the garden. Find the dimensions of her garden. Show your work.

- 6** Sunil surveys 200 students to find out how much sleep they need. He finds that students need less sleep as they get older.

Which scatter plot most likely represents the survey results?



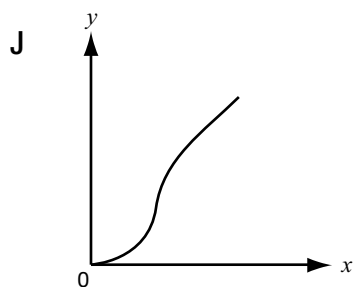
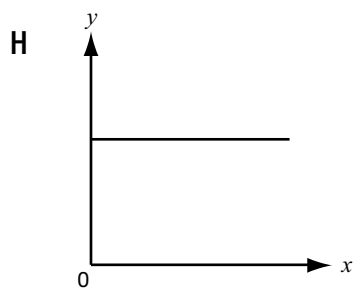
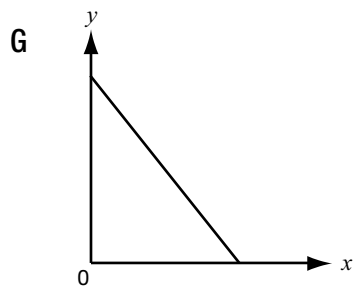
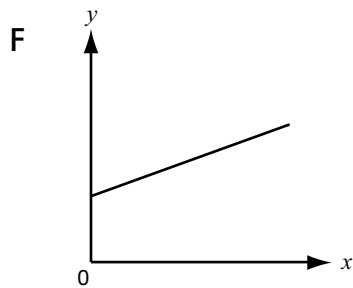
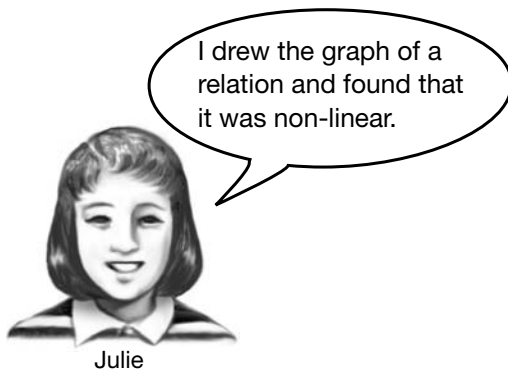
- 7** The scatter plot below shows the number of goals scored versus shots on goal by different members of a soccer team during the course of a season.



What relationship is shown in the scatter plot?

- A** There is no relationship between shots on goal and the number of goals scored.
- B** The number of goals scored decreases as the number of shots on goal increases.
- C** The number of goals scored increases as the number of shots on goal increases.
- D** The number of goals scored stays the same no matter how many shots on goal are taken.

- 8** Which graph does Julie draw?



- 9** Which table shows a linear relationship between  $x$  and  $y$ ?

**A**

$x$	$y$
1	1
2	4
3	9
4	16

**B**

$x$	$y$
1	2
2	4
3	8
4	16

**C**

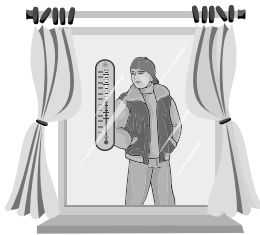
$x$	$y$
1	10
2	20
3	30
4	40

**D**

$x$	$y$
1	10
2	100
3	1000
4	10000

- 10** One spring afternoon, Michael records the outside temperature every hour in the table below.

Time (h)	Temperature (°C)
12	9.3
13	11.7
14	14.1
15	16.5
16	18.9
17	21.3



What is the **rate of change** of the temperature in relation to time?

- F 2.4 °C/h  
 G 2 °C/h  
 H 0.9 °C/h  
 J 0.42 °C/h

- 11** A banquet hall charges a fixed rate, plus a cost of \$15 per person. For a party of 50 people, the total cost is \$1200.

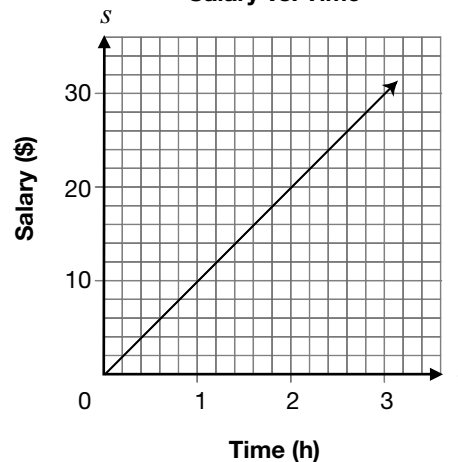
Which equation models this relation, where  $C$  is the total cost, in dollars, and  $n$  is the number of people attending?

- A  $C = 24n$   
 B  $C = 24n + 1200$   
 C  $C = 15n + 450$   
 D  $C = 15n + 1200$

- 12** The graph below represents the relationship between Jackie's salary,  $s$ , and the length of time she works,  $t$ .



Salary vs. Time



What is Jackie's **salary** when she works 8 h?

- F \$40  
 G \$80  
 H \$120  
 J \$125



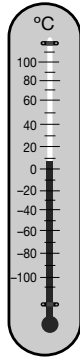
- 13** The formula

$$B = 100 - \frac{h}{156}$$

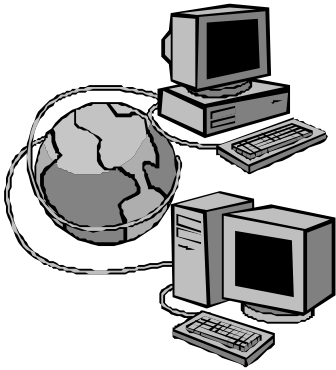
gives water's boiling point,  $B$ , in degrees Celsius at an altitude of  $h$  metres.

What is the approximate **boiling point of water** at an altitude of 5951 m?

- A 38 °C
- B 62 °C
- C 96 °C
- D 156 °C



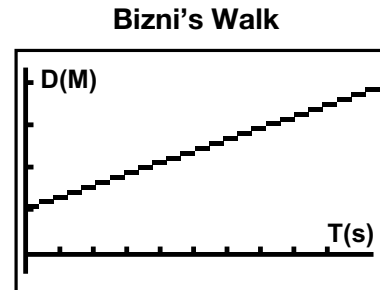
- 14** Internet Plus charges a **base fee** of \$14 **each month**, and **\$0.08 per minute**.



For how many minutes did Harpreet use the Internet if he is charged **\$42** for a month?

- F 350 min
- G 511 min
- H 525 min
- J 700 min

- 15** Bizni is 1 m from a motion detector when he starts walking. The graph produced by the graphing calculator is shown below.

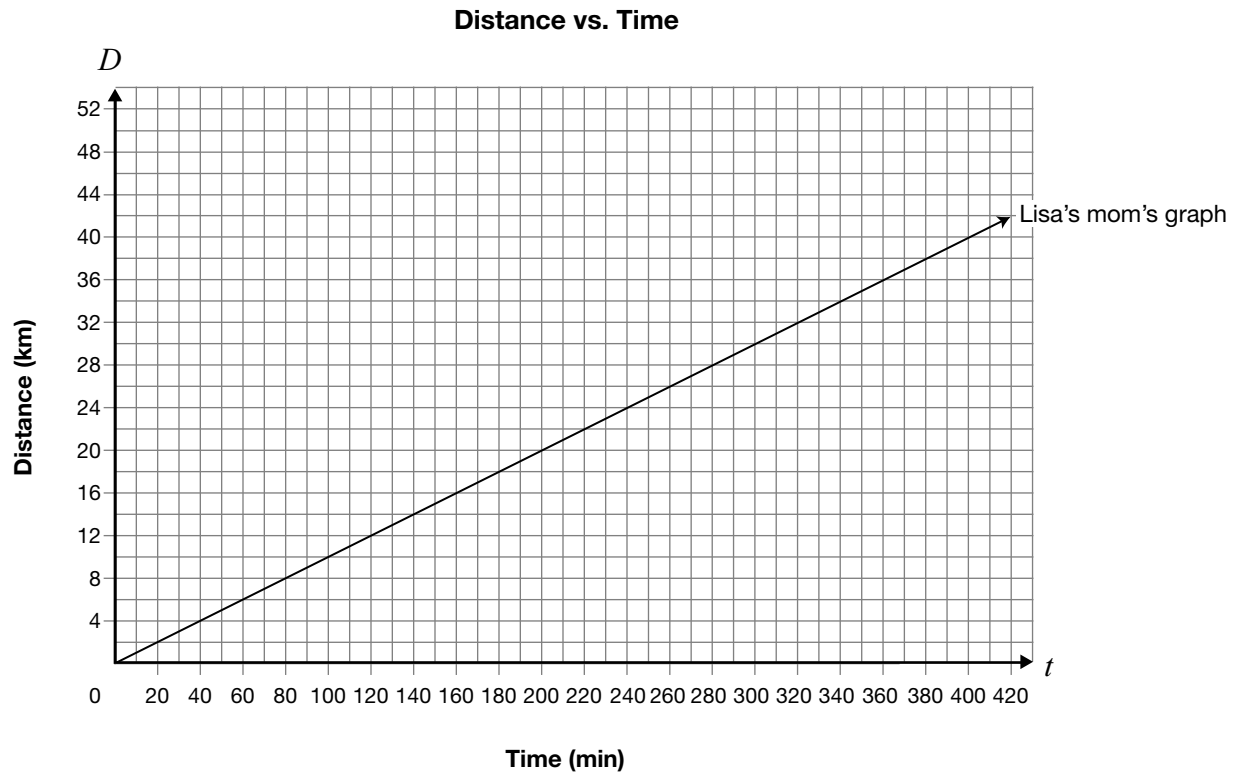


How could Bizni change his walk to produce a graph with a negative rate of change?

- A by walking farther away from the motion detector at a constant speed
- B by increasing his speed and walking away from the motion detector
- C by walking toward the motion detector at a constant speed
- D by jumping up and down in front of the motion detector

**16 Marathon Running**

Lisa and her mom decide to participate in a long-distance race called a marathon. Lisa's mom walks the marathon at an average of 1 kilometre every 10 minutes, as shown by the graph.



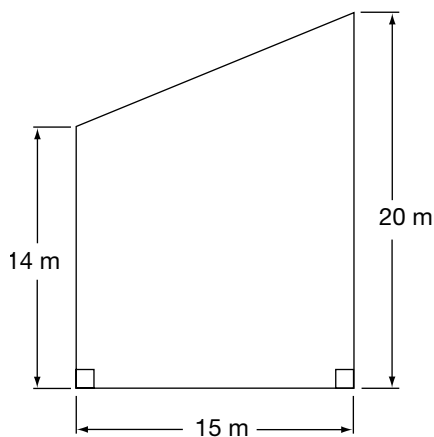
Lisa starts the marathon 2 hours after her mom started and averages 1 kilometre every 5 minutes.

When will Lisa pass her mom? Use a graphical model.

- 17** A lawn care company charges its customers based on the size of the lawn. The company uses the following schedule.

Area of lawn	Cost per month
Less than $200 \text{ m}^2$	\$50
Between $200 \text{ m}^2$ and $250 \text{ m}^2$	\$60
Between $250 \text{ m}^2$ and $300 \text{ m}^2$	\$70
Over $300 \text{ m}^2$	\$80

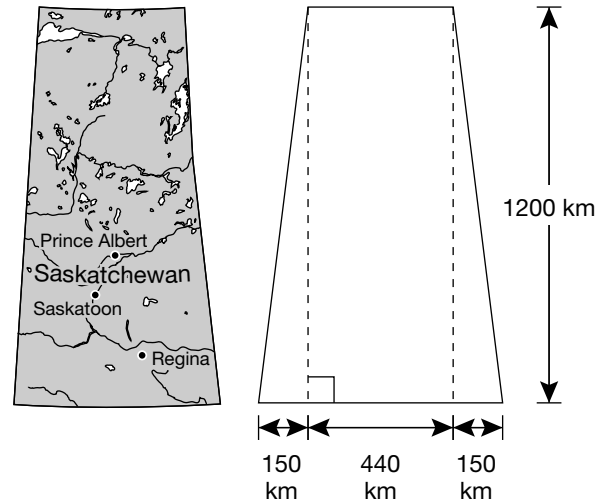
The company is caring for Denton's lawn, which has the dimensions shown.



How much should Denton be paying per month?

- A** \$50  
**B** \$60  
**C** \$70  
**D** \$80

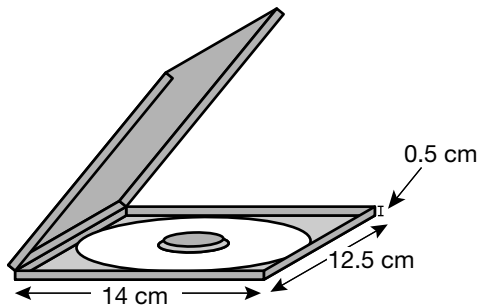
- 18** Vanessa draws a model of a map of Saskatchewan in the shape of a trapezoid. The dimensions represented on the map are shown below.



Which is closest to the area of Saskatchewan as represented by Vanessa's model?

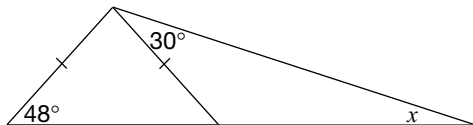
- F**  $354\,000 \text{ km}^2$   
**G**  $528\,000 \text{ km}^2$   
**H**  $708\,000 \text{ km}^2$   
**J**  $888\,000 \text{ km}^2$

- 19** A CD case has the dimensions shown in the drawing below.



What is the volume of the CD case?

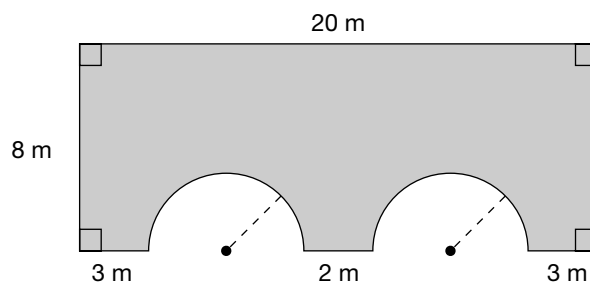
- A  $26.5 \text{ cm}^3$
  - B  $27 \text{ cm}^3$
  - C  $87.5 \text{ cm}^3$
  - D  $175 \text{ cm}^3$
- 20** Determine the value of  $x$ .



- F  $x = 18^\circ$
- G  $x = 30^\circ$
- H  $x = 48^\circ$
- J  $x = 78^\circ$

**21 Big Bridge**

The dimensions of a side of a bridge are shown in the diagram below. The arches are semicircles with the same radius.



Determine the area of the side of the bridge shown. Show your work.

**Education Quality and  
Accountability Office**



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The information in this booklet is being collected under authority of clause 4 (1) (b) and subsection 9 (6) of the *Education Quality and Accountability Office Act*, 1996, for the purposes of administering and marking tests of pupils in secondary schools and evaluating the quality and effectiveness of secondary education, in accordance with section 3 of the Act. Inquiries regarding this collection should be directed to the Senior Policy Analyst, EQAO, 2 Carlton Street, Suite 1200, Toronto, ON M5B 2M9 • 1-888-327-7377.

# Applied

## Grade 9 Assessment of Mathematics

Spring 2007

### **SAMPLE ASSESSMENT QUESTIONS**

Circle the best answer for each multiple choice question on the page.

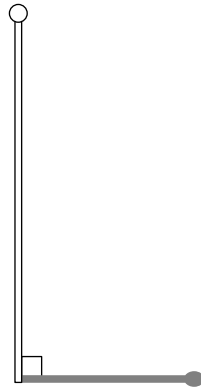
Answer each open response question in the space provided.

Education Quality and  
Accountability Office



Please note: The format of these booklets is slightly different from that used for the assessment. The items themselves remain the same.

- 1** On a sunny day, a flagpole that is 5 m tall casts a shadow that is 2.4 m long, as shown below. At the same time, a tree next to the flagpole casts a shadow that is 3.6 m long.



Which of the following proportions can be used to determine  $h$ , the height of the tree, correctly?

- A  $\frac{2.4}{5} = \frac{3.6}{h}$   
B  $\frac{2.4}{5} = \frac{h}{3.6}$   
C  $\frac{5}{6.0} = \frac{3.6}{h}$   
D  $\frac{h}{5} = \frac{2.4}{6.0}$
- 2** DJ Kool is a disc jockey who charges the same amount for each hour. For a 4-hour dance, he charges \$522.00. How much does DJ Kool charge for a 7-hour dance?
- F \$298.29  
G \$913.50  
H \$2088.00  
J \$3654.00

- 3** Alex makes necklaces using coloured beads. The ratio of blue beads to red beads is 3:4, and the ratio of red beads to yellow beads is 4:1.

Alex makes a necklace using a total of 48 beads in the ratios given above. How many yellow beads will she need?

- A 1  
B 4  
C 6  
D 8

- 4** Which of the following expressions is equal to 49?

- F  $(4 + 3)^2$   
G  $4 + 3^2$   
H  $(3 + 4)^2$   
J  $3^2 + 4^2$

- 5** Herman uses his scientific calculator to determine the value of the expression

$$\frac{4}{3}\pi(3.5)^3.$$

What is the **approximate** value of this expression?

- A 175.0  
B 175.1  
C 179.0  
D 179.6



- 6** Ivan shows his steps in solving the following equation for  $x$ :

$$2x + 3 = 7$$

Step 1:  $2x + 3 - 3 = 7 - 3$

Step 2:  $2x = 4$

Step 3:  $x = 4 \times 2$

Step 4:  $x = 8$

In which step has Ivan made an **error**?

**F** Step 1

**G** Step 2

**H** Step 3

**J** Step 4

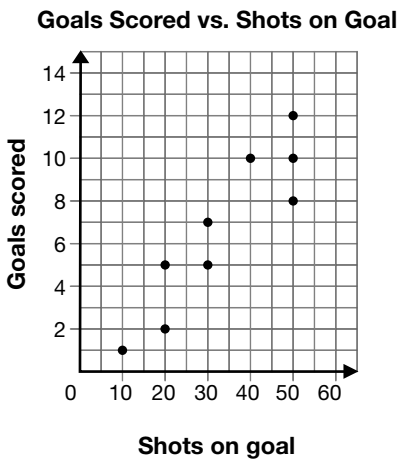
**7 Trip Planning**

The Lucas family is going on a trip to Manitoba and back. It is 1624 km from home to Manitoba.

Determine the total cost of the gas for the Lucas family's trip to Manitoba and back, if the cost of gas is 83¢ per litre and the car uses 9.7 litres per 100 kilometres.

Show your work.

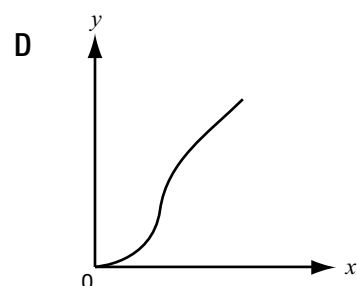
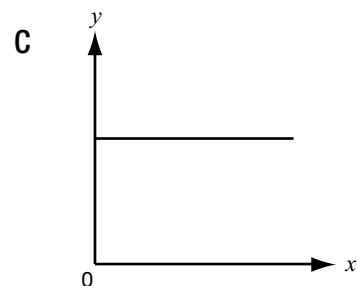
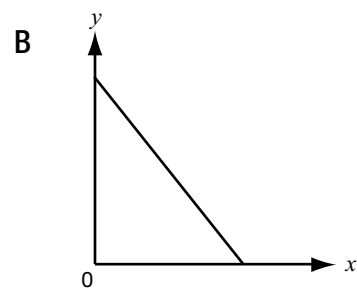
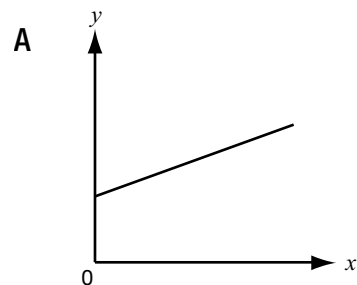
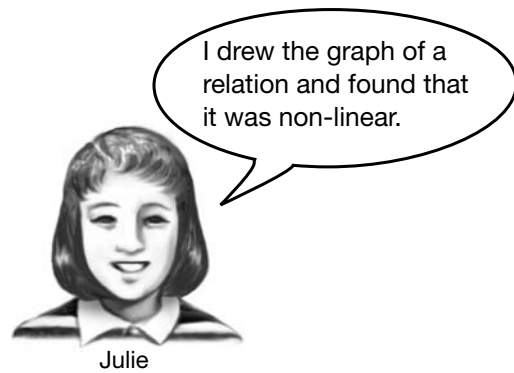
- 8** The scatter plot below shows the number of goals scored versus shots on goal by different members of a soccer team during the course of a season.



What relationship is shown in the scatter plot?

- F** There is no relationship between shots on goal and the number of goals scored.
- G** The number of goals scored decreases as the number of shots on goal increases.
- H** The number of goals scored increases as the number of shots on goal increases.
- J** The number of goals scored stays the same no matter how many shots on goal are taken.

- 9** Which graph does Julie draw?



- 10** Which table shows a linear relationship between  $x$  and  $y$ ?

**F**

$x$	$y$
1	1
2	4
3	9
4	16

**G**

$x$	$y$
1	2
2	4
3	8
4	16

**H**

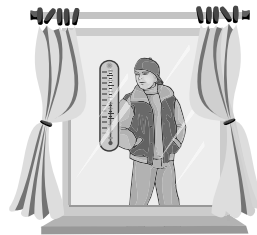
$x$	$y$
1	10
2	20
3	30
4	40

**J**

$x$	$y$
1	10
2	100
3	1000
4	10000

- 11** One spring afternoon, Michael records the outside temperature every hour in the table below.

Time (h)	Temperature ( $^{\circ}\text{C}$ )
12	9.3
13	11.7
14	14.1
15	16.5
16	18.9
17	21.3



What is the **rate of change** of the temperature in relation to time?

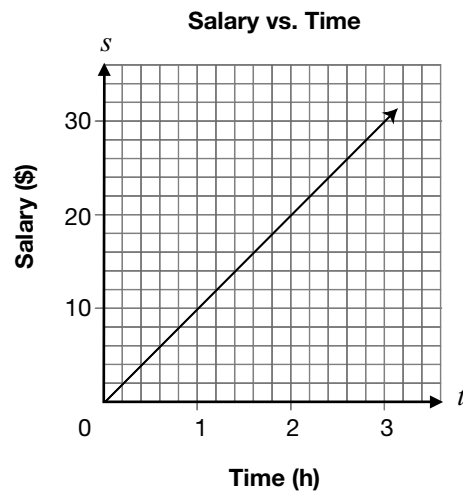
- A**  $2.4\text{ }^{\circ}\text{C/h}$   
**B**  $2\text{ }^{\circ}\text{C/h}$   
**C**  $0.9\text{ }^{\circ}\text{C/h}$   
**D**  $0.42\text{ }^{\circ}\text{C/h}$

- 12** The equation  $P = 1.2 + 0.06n$  represents the relationship between  $P$ , the total printing cost, in dollars, and  $n$ , the number of advertisements printed.

Which of the following statements is true about this relationship?

- F** The flat fee to print is \$0.06.
- G** The printing cost per advertisement is \$1.20.
- H** The flat fee to print is \$1.26.
- J** The printing cost per advertisement is \$0.06.

- 13** The graph below represents the relationship between Jackie's salary,  $s$ , and the length of time she works,  $t$ .



What is Jackie's **salary** when she works 8 h?

- A** \$40
- B** \$80
- C** \$120
- D** \$125

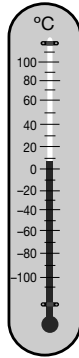
- 14 The formula

$$B = 100 - \frac{h}{156}$$

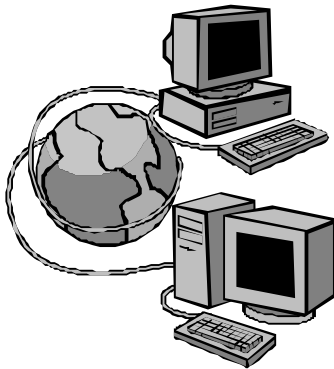
gives water's boiling point,  $B$ , in degrees Celsius at an altitude of  $h$  metres.

What is the approximate **boiling point of water** at an altitude of 5951 m?

- F 38 °C
- G 62 °C
- H 96 °C
- J 156 °C



- 15 Internet Plus charges a **base fee** of \$14 **each month**, and \$0.08 **per minute**.



For how many minutes did Harpreet use the Internet if he is charged \$42 for a month?

- A 350 min
- B 511 min
- C 525 min
- D 700 min

**16 Up in the Air**

Madiha throws a ball into the air one time. The height of the ball above ground is measured at six different times. The table below shows the data that Madiha collects.

**Height vs. Time**

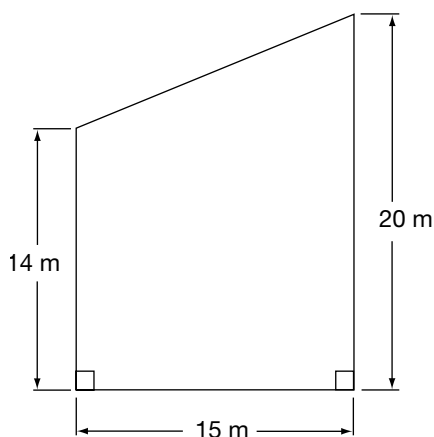
Time (sec)	Height (m)
0	1.6
0.5	7.9
1.0	11.7
1.5	13.0
2.0	11.8
2.5	8.1

Determine whether the relationship represented by the table is linear or non-linear. Justify your answer.

- 17** A lawn care company charges its customers based on the size of the lawn. The company uses the following schedule.

Area of lawn	Cost per month
Less than $200 \text{ m}^2$	\$50
Between $200 \text{ m}^2$ and $250 \text{ m}^2$	\$60
Between $250 \text{ m}^2$ and $300 \text{ m}^2$	\$70
Over $300 \text{ m}^2$	\$80

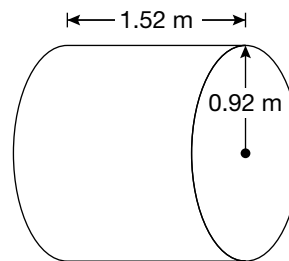
The company is caring for Denton's lawn, which has the dimensions shown.



How much should Denton be paying per month?

- A \$50
- B \$60
- C \$70
- D \$80

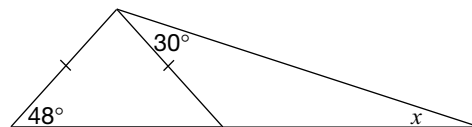
- 18** An oil tank shaped like a cylinder has a radius of 92 cm and a length of 152 cm, as shown below.



Which of the following is closest to the volume of the oil tank?

- F  $0.09 \text{ m}^3$
- G  $0.14 \text{ m}^3$
- H  $4.0 \text{ m}^3$
- J  $12.7 \text{ m}^3$

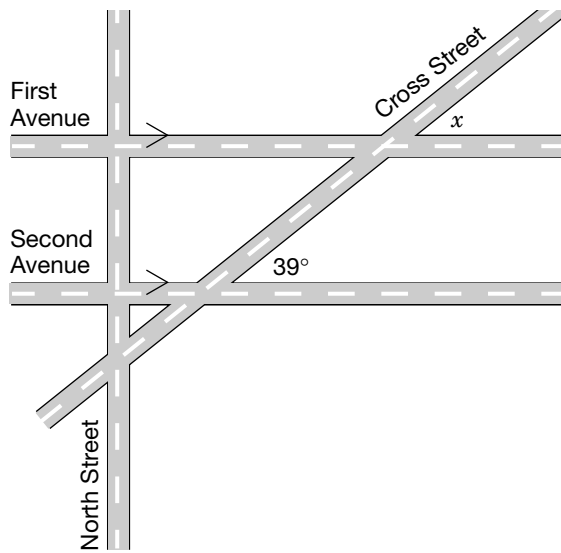
- 19** Determine the value of  $x$ .



- A  $x = 18^\circ$
- B  $x = 30^\circ$
- C  $x = 48^\circ$
- D  $x = 78^\circ$



- 20** In the map below, First Avenue and Second Avenue are parallel.

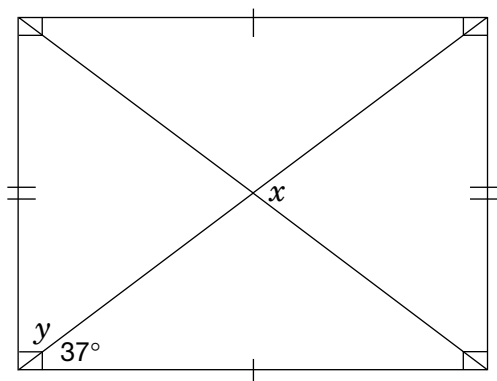


What is the value of  $x$ ?

- F  $321^\circ$
- G  $141^\circ$
- H  $51^\circ$
- J  $39^\circ$

**21 Deck Boards**

Sonya is building a rectangular deck in her backyard. The deck will have support beams running through the centre, making 4 isosceles triangles, as shown below.



Determine the values of  $x$  and  $y$ . Justify your answers.

